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Needs Assessment for U.S. EPA's Integrated Risk Information System

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National Center for Environmental Assessment
Office of Research and Development
U.S. Environmental Protection Agency
Washington, DC

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EXECUTIVE SUMMARY

The Integrated Risk Information System (IRIS) is a data base of EPA consensus opinions on the potential health effects of various chemical substances found in the environment. IRIS is relied upon as a source of toxicity information for risk-based decision-making by EPA and states, and is widely used by regulated entities and other facets of the national and international risk assessment community.

The U.S. Senate (Senate Report 106-410) requested that EPA conduct a needs assessment with public input to determine the need to update and add information to IRIS, based on the concern that EPA and state regulations rely on potentially outdated scientific information.

In assessing user needs, EPA largely relied on years of experience with the IRIS Program and annual queries of Program Offices and Regions for nominations of chemicals for assessment or reassessment. EPA supplemented this experience with a 2001 query of Agency Program Offices, Regional Offices, and the public, and received nominations for 117 individual chemicals and 14 broad chemical classes in need of assessment.

Several approaches to further define and address IRIS needs have been characterized. These approaches are broadly described as "user-need based" approaches or "systematic" approaches. Under a user-need based approach, priorities for IRIS assessments would be driven by user request. Under a systematic approach, all chemical assessments in the data base would be considered of equal importance, and updates would be undertaken based on the availability of new information rather than user request. Approaches can potentially be combined and scaled in either direction.

Input from the IRIS user community clearly indicates a need to improve the data base to meet user needs. Based in part on EPA experience and nominations for chemical assessment by Agency Program Offices and Regions and the public, EPA estimates that production of approximately 50 new or updated assessments per year might be appropriate to meet user needs. Various changes to the IRIS Program are currently being implemented that EPA believes will make the program more responsive to needs of IRIS users. Among these are efforts to transition IRIS assessment development and associated functions into a central staff within the National Center for Environmental Assessment (NCEA), to increase the number of staff dedicated to IRIS, and to reexamine the priority-setting criteria for selecting chemical substances for IRIS assessment.

1. INTRODUCTION

The Integrated Risk Information System (IRIS) is a data base of EPA's consensus opinions on the potential human health effects that may result from exposure to various substances found in the environment. IRIS contains assessments of over 540 individual chemical substances. IRIS is relied upon by EPA programs and states to support risk-based decision-making, and is widely utilized nationally and internationally in the risk assessment community. The development and consensus review of assessments for IRIS is an Agency-wide effort administered by the Office of Research and Development (ORD), National Center for Environmental Assessment (NCEA). An important feature of IRIS is the consensus review process, which involves review by senior EPA health scientists that represent ORD, EPA Program Offices, and Regional Offices. Assessments are added to IRIS only after Agency-wide consensus on the scientific opinions presented in the assessment is reached.

This report was prepared in response to the U.S. Senate request that EPA define needs for new and updated chemical assessments in the IRIS data base. Senate Report 106-410 expressed concern over the potential for EPA and state regulations to rely on outdated scientific information, and specifically stated:

> "The committee requests that EPA conduct needs assessments with public input to determine the need for increasing [this] annual rate of updates to existing IRIS files during 2002-2005, as well as the need to add new IRIS files for chemicals not now included."

Through many years of experience with the IRIS Program and annual queries of EPA Program Offices and Regions, EPA has developed a good understanding of unmet needs of IRIS users both within and external to the Agency. This experience served as an important foundation for characterizing the need for new and updated chemical assessments. EPA supplemented this experience by issuing, in July 2001, a specific request for input from EPA Program Offices and Regions and from the public on those chemicals most in need of assessment or reassessment. The responses to this query are summarized briefly in Section 3.1 of this report and more fully in an appendix to the report. Based both on past experience in the IRIS Program and the findings of the 2001 query, EPA characterized certain general approaches that might be applied to meet user needs (Section 3.2). Implementation considerations are discussed in Section 4. Section 5 discusses other issues related to user needs based on responses to the 2001 query of IRIS users.

2. BACKGROUND

2.1. History of IRIS Needs Evaluations

EPA's initial purpose in creating IRIS in 1985 was to develop EPA consensus opinions about the health effects that may result from chronic exposure to various substances found in the environment, and to provide these opinions in a data base accessible across the Agency. By providing a common source of health effects information in the Agency, the intent was that IRIS could help EPA programs reduce inconsistency in toxicity assessments, and therefore risk assessments. The importance of IRIS grew as regulatory programs in EPA and states came to rely on IRIS information in decision-making. The urgency to improve and maintain the system became clear in the early 1990s.

EPA's IRIS Quality Action Team (QAT) produced a report to the Agency in 1994. It highlighted the importance of the IRIS data base, the need for the Agency to devote resources to IRIS, the need for periodic updates of information on IRIS, the need for peer review and public involvement, and a recommendation that the Agency authorize a group to present options to the Science Policy Council (SPC) for improving the management of the IRIS program. These recommendations were subsequently implemented through the IRIS Pilot and the formation of the IRIS Implementation Strategy Team.

EPA conducted the IRIS Pilot Program from 1995-1997. The Pilot tested new operational procedures for the IRIS Program, including assigning chemical assessments to a set of chemical managers working under the general coordination of a central program manager, designed a new standard Toxicological Review support document to accompany each IRIS summary, estimated needs for extramural resources and contracting mechanisms, developed a process for incorporating peer review into the IRIS review process, and revised the consensus review process by setting up a standing group of senior health scientists representing the Program Offices and Regions in the review of all cancer and noncancer health effects for each chemical under IRIS review.

The SPC formed an IRIS Implementation Strategy Team in 1996 to determine what was needed to get the IRIS Program and data base functioning optimally. Major recommendations from the Team reported to the SPC in 1997 were that: (1) the scientific information in IRIS needed to be brought up to date, (2) EPA needed to set up an annual agenda for IRIS and report it to the public, (3) EPA needed to form a central IRIS staff responsible for the data base as a whole and to work with the rest of the Agency on assessment development and reviews, (4) IRIS needed to be made available on the Internet, and (5) more outreach to users was needed. The executive summary from the report of the IRIS Implementation Team is provided in Appendix A.

2.2. Current Status

Since the report to the SPC in 1997, and in response to one of its major recommendations, a central IRIS staff has been formed in ORD/NCEA. The staff has implemented many of the recommendations from the Team report, including developing an annual agenda and making this available to the public. The agenda lists the chemical substances for which EPA will initiate assessments in the coming year, and gives expected completion dates for assessments in progress. The staff has also implemented Team recommendations by uploading IRIS to the Internet, improving outreach to users through an improved Hotline service, and working with Agency programs. Opportunities for public involvement have been provided through annual solicitation (via the Federal Register) for the submission of scientific information relevant to new chemical assessments and through the posting on EPA's web site of external review drafts of IRIS assessments and consideration of public comments received on these drafts. IRIS staff scientists lead some assessments, and coordinate with other parts of the Agency where IRIS assessments are prepared to improve assessment quality and consistency. The overall process for IRIS assessment development and review put in place following the 1997 SPC report is summarized in Appendix B of this report.

There are over 540 chemical substances with assessments on IRIS. Over 100 new and updated assessments have been undertaken since 1998; 33 assessments were completed and loaded on IRIS between 1998 and July 2003. Staff availability and other constraints across the Agency have resulted in fewer than 10 chemical assessments per year completed and added to the IRIS data base.

One of the determinants of the pace of EPA's assessments is the widening scope of "an assessment." The effort needed to complete an assessment has become significant in recent years. Prior to the IRIS Pilot, an assessment may have consisted of a short IRIS summary. The summary was frequently based upon a more detailed support document, but this larger document generally was not evaluated as part of the IRIS review. With the emphasis in the IRIS Pilot of more complete articulation and justification for health effects conclusions, each assessment since 1996 has become much more detailed and inclusive of all chronic health endpoints. Assessments also encompass rigorous, sequential internal and external peer review. Further, there is a larger set of risk assessment and risk characterization guidelines to apply, more methods and opportunities for dose-response modeling, and science-policy judgments have become more numerous and complex. Agency consensus review involves larger documents and more complex decisions. As each IRIS assessment is updated, all of the above-mentioned procedures are invoked, in addition to an evaluation of new scientific information. As a consequence, IRIS

assessments require increasing time and effort to complete. At present, many assessments take anywhere from 2 to 5 years to complete, depending on the complexity of the assessment and staff resources. Some assessments that are scientifically complex or highly controversial can take longer to complete.

2.3. Direction

EPA predicts a long-term need for IRIS, and endeavors foremost to serve EPA programs but also to serve our many external users. EPA's intent is to provide all users with an up-to-date, credible source of scientific information to support decision-making.

3. DEFINING THE SCOPE OF IRIS NEEDS

EPA determined that of particular relevance in defining the scope of IRIS needs was its years of experience with the IRIS Program (including correspondence received by the IRIS Submission Desk and other communications) and the response to the annual query of Program Offices and Regions for nominations for new or updated assessments. In response to the Senate request, EPA also conducted a query of EPA Program Offices and Regions and the public in July 2001 to obtain input on user needs at one point in time. Based on both Agency experience and responses to the 2001 query, EPA characterized user needs – and approaches to addressing those needs – in terms of those needs that are driven primarily by IRIS users and those that are driven more by a more systematic updating of the data base. These approaches are described more fully below.

3.1. Summary Findings from a Query of IRIS Users

EPA's primary approach to defining the scope of user needs for IRIS was to combine the results of its annual query to EPA with a similar query to the public. The public query was printed in the Federal Register July 20, 2001 (66 FR 37957) for a 60-day comment period. The query asked the public which chemical substances they believe are most needed for assessment or reassessment on IRIS. An EPA contractor compiled the results, which comprises Appendix C of this report. There were 16 EPA Office and Regional respondents, and 22 non-EPA (public) respondents. Among the 22 non-EPA respondents, 10 were from the U.S. Army and state agencies, and 12 were non-governmental respondents (including industries, trade organizations, public interest and non-profit organizations). Because of the small response size, it is not clear if the responses received are necessarily representative of the broad range of IRIS users.

The 2001 query of EPA Program Offices and Regions and the public identified 117 compounds, plus 14 broad chemical classes of indeterminate size, such as biological contaminants, radionuclides, and pharmaceuticals, for which new or updated assessments were needed.

The full list of nominated chemicals and summary of responses to the FR query can be found in Appendix C of this report.

3.2 Approaches to Defining the Scope of IRIS Needs

There are a variety of ways to broadly define the scope of what is needed to update the IRIS data base. Some examples are described below. These examples are categorized as either user-need based approaches, which focus on the specific chemical assessment needs expressed by IRIS users, or systematic data base approaches, with more generic methods to address the IRIS data base as a whole. These examples are not mutually exclusive, and can be scaled up or down depending upon available resources.

3.2.1. User-Need Based Approaches

EPA's approach since 1998 to developing the annual IRIS agenda has been to annually query EPA management in Program Offices and Regions for their priority chemicals for assessment and reassessment, and apply a general set of criteria to determine which assessments to undertake with available resources. The criteria are: (1) Agency statutory, regulatory, or program implementation need; (2) new scientific information or methodology is available that might significantly change current IRIS information; (3) interest to other levels of government or the public; or (4) much of the scientific assessment work has been completed while meeting other requirements, and only a modest additional effort will be needed to complete the review and documentation for IRIS. A review was conducted in spring 2003 of previous chemical substance nominations to determine if public health concerns were implicitly covered by the statutory, regulatory, or programmatic needs driving chemical nominations. Public health impact was defined, for this purpose, as being associated with adverse human health effects or widespread exposure. Based on the finding that most of the chemicals nominated in the annual priority-setting process have known or suspected toxicity and known or suspected widespread exposure, EPA concluded that public health concerns appear to be adequately subsumed in the current IRIS nomination process.

Based on the 2001 query of EPA Program Offices and Regions and the public, 117 compounds, plus 14 broad chemical classes of indeterminate size, such as biological

contaminants, radionuclides, and pharmaceuticals, were identified as in need of a new or updated assessments. Assuming some toxicological commonalities within each large grouping, the work effort for each chemical class could be conservatively estimated as equivalent to that for 3 individual assessments, for a total equivalent of 159 assessments. Approximately 30 additional chemical substances were nominated or otherwise suggested to the IRIS Program over the previous 5 years but were not selected for the IRIS agenda, and did not appear in the recent user needs query. In the future, EPA plans to query users for additional chemical nominations and updates, as new chemicals become subject to regulatory action and new scientific information emerges on existing chemicals.

An alternative approach to defining the scope of IRIS needs based on user requests would be for EPA to assess the chemical substances of greatest need only, i.e., giving weight to chemicals that have a higher demand among IRIS users than others due to ubiquity in the environment and/or toxicity. For example, EPA could identify the most-requested 40 chemicals, update those on a 4-year cycle, and identify a second tier of 80 chemicals to update on an 8-year cycle. The remaining chemical assessments could then be on less frequent update schedules or could be archived, i.e., stored electronically for historical use, but not updated.

The benefit of a user-request approach to determining IRIS needs is that it can set priorities for utilizing resources based on the needs articulated by users. It does not treat all chemicals equally or assume that updating one prevalent, toxic chemical is as important to public health as updating one less common or less harmful. It also treats the importance of adding new assessments to IRIS as equal to the updating of older assessments. In addition, user needs can be re-examined periodically to determine if priorities have changed. A disadvantage of an approach driven by user needs is that it depends on requests from users for new or updated assessments, and thus results in uneven attention to chemicals in the data base. Chemicals with relatively low user interest will be far less likely to be updated to reflect the most recent scientific literature and regulatory guidance, leading to uneven quality across assessments in the IRIS data base.

3.2.2. Systematic Approaches

Another type of approach to addressing IRIS needs is a systematic approach, whereby the IRIS data base is considered as a whole, and all chemical assessments are considered of equal importance to update. Updates would be undertaken on the basis of whether the data base is complete and correct rather than whether an assessment had been requested by a user.

EPA could utilize its IRIS literature screening project to identify chemicals for which new literature may be available that, if evaluated in an IRIS assessment, could potentially impact an

existing toxicity value or cancer weight-of-evidence determination on IRIS. The results of the screening project for 460 IRIS chemicals considered to date suggest that approximately 37% of the chemicals fall into this category. EPA could formulate a schedule for systematically updating the approximately 200 (37%) potentially outdated IRIS assessments on the data base. This approach could be undertaken over any time span to match resource availability with rate of desired updating. Summary findings of the literature screening project for 300 chemicals were added to the IRIS data base in December 2002; additional findings for the remaining IRIS chemicals will be added as they become available. Until assessments on IRIS are updated, the results of the literature screen will serve to identify for IRIS users those chemical assessments on IRIS that do not take into consideration potentially significant new information available since the existing toxicity values were developed.

Alternatively, EPA could plan to update all assessments on IRIS (or a subset) every 5 years (i.e., 110/yr) or every 10 years (i.e., 55/yr), regardless of whether the assessment is requested or whether there is new pertinent scientific literature available.

As another alternative, EPA could compile an inclusive list of chemicals of potential interest from all major EPA programs, regardless of whether they had ever been on IRIS, and plan development of assessments, e.g., all air toxics, pesticides, major hazardous site contaminants, etc. There are potentially several thousand chemicals in this category.

An advantage to any type of systematic approach is that it considers IRIS in its entirety and emphasizes keeping the entire data base equally up to date. A disadvantage is that it does not reflect the uneven interest of different chemical assessments to the user community and would not facilitate the parsing of resources accordingly. In addition, it would not target chemicals where significant new literature has become available.

4. IMPLEMENTING A PROGRAM TO MEET IRIS NEEDS

It is EPA's intent that the IRIS data base be updated and expanded to include new assessments requested by IRIS users as soon as practically possible. EPA recognizes that the best use of resources will be to continue to prioritize chemicals for assessment or reassessment. Chemical substances identified through user queries (e.g., those identified in Appendix C of this report) should be prioritized based on Agency needs and other user needs, and placed on a schedule for assessment. Concurrently, a schedule should be developed for addressing potentially outdated assessments identified through EPA's IRIS literature screening project. This second schedule should consider the priority of each chemical assessment to users and provide an array of actions accordingly, such as 5-year or 10-year updates or archiving (e.g., placement of

files in an inactive part of the data base). Longer-term cyclical maintenance for the whole data base could be similarly devised, with special reviews added as needed to address immediate user needs. EPA is examining its current process for prioritizing chemicals for assessment or reassessment. As a first step, EPA sponsored a stakeholder workshop on priority-setting criteria for selecting chemical substances for IRIS assessment on March 4, 2003. A revised prioritization scheme will need to take into consideration Agency and other user needs, as well as those issues raised by both the user-need based approach and the systematic approach to addressing user needs.

Based on past experience with IRIS and Agency and external nominations for chemical assessments, EPA believes a level of production responsive to user needs would be approximately 50 new or updated chemical assessments per year, with an archive rate balancing new assessments. Undertaking 50 assessments per year would allow each chemical (other than those archived) to be updated at least every 10 years, with some on a 5-year review cycle and some selected for special review based on immediate user need. For example, a 10-year plan might be for 300 chemicals to undergo a 10-year cycle update, 100 chemicals to undergo two 5-year cycle updates, 20 chemicals to undergo special reviews when needed, 20 new chemicals to be added to the data base, and 100 chemicals to be archived from the data base. Under this approach, 320 chemicals (those on the 10-year cycle and those chosen for special review) would be reassessed once within 10 years, 100 would be reassessed twice, 20 would be assessed for the first time under the IRIS Program, and 100 would be removed from consideration for reassessment based on diminished interest from IRIS users or the Agency. An example such as this one would be consistent with the Agency's current emphasis on updating older assessments on IRIS over adding new assessments. Decisions regarding which chemicals would fall into the various categories would be informed by user needs and EPA's literature screening. This type of long-range planned effort would result in a reasonably updated data base and a predictable work flow for the Agency.

Because of the multiple responsibilities assigned to chemical managers outside of the IRIS Program aside from IRIS assessment work, some assessments may take longer to complete than initially anticipated and the total throughput of IRIS assessments has been slower than desired. To increase the rate of completion of IRIS assessments, the IRIS Program has begun the process of centralizing assessment development within ORD/NCEA and increasing the number of dedicated IRIS staff. The 2004 President's Budget provided $7 million for this centralization and modernization effort. EPA expects an increase in the rate of production of IRIS assessments as a direct result of the increase in resources dedicated to IRIS.

5. OTHER USER NEEDS ISSUES

The query regarding IRIS user needs provided to EPA Programs, Regions, and the public in July, 2001 also asked for responses to two general questions:

1. Whether there was support for adding toxicity information for less-than-lifetime exposure durations (e.g., acute and subchronic durations). Generally, respondents supported this idea, some saying that updating the chronic information on IRIS is a higher priority if resources are limited. [Ten of 18 respondents endorsed the inclusion of less-than-lifetime reference values, and 7 of 18 provided qualified or guarded endorsement.] The addition of new exposure durations to standard chronic exposures is currently being piloted. This pilot will help to identify issues and to estimate resource implications.

2. Whether and how EPA should work with external parties on IRIS assessment development. Responses were mixed on this idea. [Six of 17 respondents endorsed collaborative efforts, and 10 of 17 provided qualified or guarded endorsement.] Some respondents observed that collaboration with scientists outside of EPA makes use of external expertise and could improve the overall quality of IRIS assessments. A number of concerns were expressed about potential conflict of interest of external parties that might have a stake in the outcome of the assessment. Several mentioned the need for safeguards from conflict of interest, such as EPA-managed peer reviews. Some respondents offered the opinion that the use of external parties could expedite the addition of new or updated assessments to IRIS. In addition, collaboration with scientists outside of EPA makes use of all expertise, ensuring the best available science is used. If an assessment is accomplished via collaboration with an external party, such as an industry or another government agency, however, EPA's experience suggests that the FTE cost to EPA will be virtually the same (in every case, an EPA chemical manager would be assigned to oversee the assessment, internal peer review, consensus review, management, and administrative support). The resource impact is that extramural costs for assessment development can be reduced or eliminated. The extramural cost for external peer review would remain the same.

See Appendix C of this report for a more detailed summary of user responses to these questions.

6. SUMMARY

IRIS is a data base of EPA consensus opinions on the health effects of various chemical substances found in the environment. IRIS is widely relied upon as a source of toxicity information for decision-making in EPA and the states regulations. Stakeholders also include regulated entities and other facets of the national and international risk assessment community. The U.S. Senate requested that EPA conduct a needs assessment to determine the need to update and add information to IRIS, concerned that EPA and state regulations rely on potentially outdated scientific information. EPA has recognized that the completion of IRIS updates has not kept pace with user needs. EPA queried Agency Program Offices, Regional Offices, and the public in 2001, and received nominations for 117 individual chemicals and 14 broad chemical classes in need of new or updated assessment. Several approaches to further defining and addressing IRIS needs are discussed. Approaches can potentially be combined and scaled in either direction. An example analysis to increase the rate of completion of new and updated assessments is described.

APPENDIX A

IRIS Implementation Strategy Team

Report to the Science Policy Council

February 1997

EXECUTIVE SUMMARY

IRIS (or Integrated Risk Information System) is an Environmental Protection Agency (EPA) data base of Agency consensus health information on chemicals of concern in the environment. IRIS provides health effects information needed for risk assessments and other health evaluations. The data base is currently administered within the Agency's Office of Research and Development's (ORD's) National Center for Environmental Assessment (NCEA). However, the development of information for the data base has been a cross-Agency cooperative effort. The Agency has made significant strides in providing consistent, reliable toxicity information on hundreds of chemical substances of environmental concern. IRIS' use has grown tremendously since it was first made public in 1986, to the point where many risk assessors and others at all levels of government, the public and private sectors have come to depend on the information it contains.

While EPA's goal is that IRIS be a source of high-quality health information based on credible science, significant impediments to realizing that goal have arisen over the past several years. Critical issues are that the data base has not been kept current, IRIS entries have not always undergone external peer review, and that there is limited access and limited service to users.

A significant amount of analysis has previously been done within and outside the Agency about the needs and shortcomings of IRIS, as described in the report of EPA's IRIS Quality Action Team (QAT; report submitted July 25, 1994 to the Science Policy Council). Subsequently, the IRIS Upgrade Workgroup addressed resource needs in the Agency for sustaining the program. The IRIS Pilot Program began in 1995, and is currently testing a number of improvements including a new internal consensus process. The IRIS Implementation Strategy Team worked from March - September, 1996 to codify the major issues with IRIS, provide recommendations, and devise an integrated plan for a stable, long-term IRIS Program. This report is the result of that effort.

The most significant and overarching problem that has been consistently identified is that IRIS, as a cross-Agency repository for information, lacks a central organization. While many Offices, Regions, and individuals participate in various aspects of preparing information that eventually is entered into IRIS, there is no central staff accountable for planning and carrying out a long-range program of ensuring the quality of the data base. This includes producing and updating health assessments for IRIS in accordance with a set of priorities and a schedule, ensuring appropriate external peer review, facilitating Agency consensus and resolving issues in a timely manner, prompt preparation of final IRIS files, as well as implementing long-term improvements in data base management and outreach to users. In the framework of a more centralized IRIS organization with appropriate resources, a number of significant improvements are possible, including methodical updates to IRIS content, a widely-accessible Internet delivery system of IRIS, and a stronger, more interactive system of public outreach and communication. The IRIS Implementation Strategy Team provides options and recommendations for achieving these improvements in this report.

The major recommendations from this report may be summarized as follows:

1. Content of IRIS

- Set up an assessment / reassessment schedule to update the scientific information in IRIS. Schedule should consider a number of criteria, including resources available, Program Office needs, availability of new scientific information, and compatibility with other assessment / reassessment activities in the Agency.

- Concentrate first on improving chronic human health effects information. In the future, consider other health endpoints, and ecological information if a consensus process is developed.

- Provide better characterizations of hazard and dose-response information in IRIS summaries and support documents.

- Conduct external peer review of all new and revised IRIS summaries and support documents.

- Use results of the IRIS Pilot to determine the best consensus process for the permanent IRIS Program.

2. Access to IRIS

- Provide Internet web access to IRIS as soon as possible to reach a broader range of users. A prototype delivery system has been developed and can be uploaded to the EPA home page for immediate use and comment. A more elaborate "ultimate" delivery system with user interfaces and built-in search capabilities should be developed and uploaded to the home page within a year.

- Phase out IRIS2 as the Internet becomes accessible to all Agency users.

3. Outreach to Users

- Expand IRIS Hotline support to serve a larger and potentially more diverse Internet audience.

- Build a stronger outreach program, including tutorials and user interfaces built into the "ultimate" Internet delivery system of IRIS.

- Continue to define future users, especially at the community level, and consider ways to make IRIS more user-friendly.

4. Resources and Infrastructure

- Provide a central Program Manager who is accountable for the IRIS data base and all associated functions.

- Provide dedicated staff to develop health assessments for IRIS, take the assessments through internal and external peer review, and through Agency consensus review. Dedicated staff are also needed to manage the Internet delivery system of IRIS, and provide additional outreach materials and services.

- Provide staff across the Agency to serve part-time as internal peer reviewers and consensus reviewers.

- Provide extramural resources and efficient contracting mechanisms for IRIS file development and external peer review.

APPENDIX B
The Current Process for IRIS Assessment Development and Review

The purpose of this document is to briefly describe the process whereby EPA selects a chemical substance for assessment, conducts the assessment, carries out internal and external peer review and consensus review, and prepares a final document for the IRIS data base. EPA's process for developing IRIS consists of: (1) an annual Federal Register announcement of EPA's IRIS agenda and call for scientific information from the public on the selected chemical substances, (2) a search of the current literature, (3) development of health assessments and draft IRIS summaries, (4) peer review within EPA, (5) peer review outside EPA, (6) EPA consensus review and management approval, (7) preparation of final IRIS summaries and supporting documents, and (8) entry of summaries and supporting documents into the IRIS data base.

I. Selection of Chemical Substances

EPA develops a list of substances for IRIS assessment on an annual basis. Chemicals are selected based on one or more of the following factors: (1) Agency statutory, regulatory, or program implementation need; (2) the availability of new scientific information or methodology that might significantly change current IRIS information, (3) interest to other levels of government or the public, (4) most of the scientific assessment work has been completed while meeting other Agency requirements, and only a modest additional effort will be needed to complete the review and documentation for IRIS. Due to limited resources in the Agency to address the spectrum of needs identified by these four factors, a subset are selected for EPA assessment.

Final selection of chemicals is made among the IRIS-sponsoring Offices (Office of Research and Development, EPA Program Offices, and sometimes Regional Offices) based on the availability and expertise of staff and extramural resources. A final annual agenda is then compiled by NCEA's IRIS staff and published in the Federal Register. The Federal Register notice asks for scientific input from the public on the substances beginning review. EPA considers this information in the development of the assessment.

II. Preparation of Draft Assessments

IRIS-sponsoring Offices assign a Chemical Manager for each chemical. This health scientist is responsible for the development of the IRIS Summary and Toxicological Review (or other support document) and the shepherding of those documents through peer review, consensus

review, editing, and approvals. The Chemical Managers and their supervisors coordinate with the IRIS Program Director and IRIS staff to discuss scientific and procedural aspects of IRIS assessments and to promote consistent application of methodologies and documentation.

The Chemical Manager is responsible for conducting a literature search, scientific analysis, and development of the draft IRIS Summary and Toxicological Review (or other background document). EPA's risk assessment guidelines form the basis for the analysis. This work often occurs with assistance from a contractor. In certain cases, preparation or evaluation of studies and models is accomplished through collaboration with other organizations. Once drafted and approved through the sponsoring Office, the assessment is then ready for peer review.

III. Peer Review

In accordance with Agency guidance on peer review (Peer Review Handbook, 2nd edition, EPA 100-B-00-001, December 2000), the peer review for each assessment is coordinated within each Chemical Manager's own Office.

Internal Peer Review

The sponsoring office selects internal (EPA) peer reviewers to provide detailed scientific feedback on the draft assessment. The comments are incorporated into the assessment, as appropriate, and the assessment is then ready for external peer review.

External Peer Review

The sponsoring Office obtains external peer review. The form of review will range from letter reviews, to panel meetings, to SAB or other FACA review based upon the judgment of the scientific complexity by the sponsoring Office. Although IRIS is not subject to notice and comment requirements of the Administrative Procedures Act, EPA posts the draft assessment on the internet for public viewing during the external peer review period. Any comments submitted are considered by the sponsoring Office. In some cases, EPA solicits public comment (e.g., prior to an SAB review, or for other program needs) when the assessment is posted.

The sponsoring Office incorporates external peer review comments and any public scientific response as appropriate, and develops a written summary and disposition of major comments as an Appendix to the Toxicological Review.

IV. Agency Consensus Process

The IRIS Program consensus process involves a review of IRIS Summaries and Toxicological Reviews by senior health representatives of ORD, the EPA Program Offices and Regional Offices. The purpose of the consensus review is to obtain broad Agency consensus on: (1) whether a clear and logical explanation is given of how the conclusions and decisions in the assessment were reached; (2) how external peer review comments were addressed and incorporated; and (3) whether relevant EPA guidelines and science policy have been appropriately applied. The goal of IRIS consensus is unanimous agreement; however, if unanimity is not reached after discussion and negotiation, consensus may be reached when there is general agreement among a strong majority of the Offices and Regions that have participated. The IRIS Program Director recommends a consensus decision to the NCEA Associate Director for Health, who documents by memorandum that Agency consensus has been reached.

V. Final Approval and Disposition of Documents

After incorporating any comments from the consensus process and ensuring a scientifically complete and internally consistent set of documents, the sponsoring Office provides final draft documents for technical editing followed by a quality assurance approval by the IRIS Program Director and staff. The documents are then submitted to NCEA's IRIS webmaster contractor for loading on IRIS (www.epa.gov/iris). Questions from the public about the assessment after it is posted on IRIS can be referred to NCEA's IRIS Hotline contractor. Specific contact information is provided on the IRIS web site.

The central IRIS file and public reading room located at the IRIS Hotline contractor facility, is the repository for the peer review record for the assessment, the summary of the consensus review, the final consensus memorandum, copies of key references (documenting "principal studies" used in the assessment), any difficult-to-find reference material including unpublished studies, relevant EPA reports, foreign translations, and any public submissions.

APPENDIX C

Needs Assessment for U.S. EPA's Integrated Risk Information System

Responses from U.S. EPA Regional and Program Offices and the Public

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(Updated August 2003)

1. INTRODUCTION

The U.S. EPA's Integrated Risk Information System (IRIS) is a database containing Agency consensus scientific positions on potential adverse health effects that may result from chronic (or lifetime) exposure to chemical substances found in the environment.

With information on the health effects of over 500 chemical substances, the database contains summaries of available qualitative and quantitative health information in support of the first two steps of the risk assessments process, i.e., hazard identification and dose-response evaluation. Quantitative chemical-specific information on IRIS includes the reference dose (RfD) for non-cancer health effects resulting from oral exposure, the reference concentration (RfC) for non-cancer health effects resulting from inhalation exposure, and carcinogen assessments for both oral and inhalation exposure. The combination of quantitative health hazard assessments on IRIS and estimates of current or future exposure provide an evaluation of the health risks potentially accruing to the public from contact with environmental contaminants.

Since IRIS was made available to the public in 1988, its growing primacy as a source of information on chemical risk has prompted the EPA to a number of initiatives aimed at improving the overall quality and accessibility of the database, to better serve the needs of Agency scientists and the environmental community. For example, in 1993, the Agency requested public comment on peer review procedures for IRIS health assessments and on public involvement in IRIS assessment development and review. Other initiatives have included a 1994 study and report from the Agency's IRIS Quality Action Team (QAT), the IRIS Pilot Program (1995-1997) in which new procedures for assessment development, peer review, public involvement and consensus review were tested, and a study and report to the EPA Science Policy Council from the IRIS Implementation Strategy Team (1997). In 1997, public accessibility was enhanced by the provision of IRIS on the U.S. EPA's Internet site.

Between 1998 and 2001, the Agency implemented numerous improvements identified in these initiatives. For example, an annual Federal Register notice now announces the IRIS agenda for the year and requests scientific information from the public to be considered in new

assessments. In addition, the Agency initiated evaluations or re-evaluations of over 100 chemicals for the IRIS Program during this 3-year period.

In September 2000, the U.S. Senate Appropriations Committee requested that EPA conduct a Needs Assessment to determine whether the current annual rate of updating existing IRIS files should be increased and to assess the extent of need for information on chemicals not now included. The Agency responded to this request by (1) sending a query in July 2001 to Program Offices and Regions seeking input on those chemicals for which new or updated health assessments are needed, and alerting the offices that responses are needed to incorporate into the Needs Assessment, and (2) soliciting public input through the issuance of a July 2001 Federal Register notice (66 FR 37958). The following questions were posed:

1. How do you/your organization use IRIS? What actions or decisions are based on information in IRIS?

2. What additional chemical substance assessments do you need on IRIS? For each, why is this assessment needed?

3. For existing chemical substance assessments on IRIS, which do you think are in greatest need of scientific update? What is the basis for identifying these assessments for update (e.g., newer study available, newer methodology to apply)?

4. What additional types of substance-specific Agency consensus information would you like to have on IRIS? For example, EPA is considering adding consensus health assessments for exposures of less than chronic duration, such as acute and possibly subchronic exposures. Would these types of information be of value to you? If so, how important would this information be to you in comparison to having updated information on chronic health effects?

5. EPA is currently testing collaborative efforts with external parties on the development of assessments for IRIS (66 FR 11165). The purpose is to involve the scientific knowledge and capability of organizations outside of EPA to improve the quality of IRIS supporting documents. External parties may include other government agencies, industries, universities, professional organizations, and other non-governmental organizations. EPA will evaluate the efficiency of the process and quality of documents produced to determine if the collaborative program should be expanded.

Do you favor EPA's collaboration with external parties as a means of developing assessments for IRIS? If so, how could this collaboration be conducted?

This report summarizes the replies from the 17 EPA Program Offices and Regions and the 22 public and private entities that responded to the 2001 request for input on IRIS user needs. The latter include other agencies of the U.S. government, state governments and agencies, industry and trade organizations, private companies, and members of the public. All responses are set forth in Section 2 of this report, in which Section 2.2 summarizes input on chemical nominations (based on the annual intra-Agency request for nominations and the Federal Register notice). Responses to the other questions posed in the solicitation are summarized in Section 2.3. Section 2.4 summarizes other concerns about IRIS raised by respondents.

2. RESULTS

2.1. Respondents

Table 1 lists the 17 EPA Program and regional offices that nominated compounds for IRIS assessments or updating. In addition, most of these offices provided responses to one or more of the questions posed in the IRIS Program's Needs Assessment. The 22 non-EPA governmental, state, industrial, and public interest organizations responding to the solicitation in 66 FR 37958 are listed in Table 2. Because of the small response size, it is not clear if the responses received by the public are necessarily representative of the broad range of IRIS users.

2.2. Chemicals Nominated for Inclusion or Updating in the IRIS Database

The chemicals nominated for IRIS evaluation are broken out according to whether the respondents were from EPA Program Offices and the Regions (Table 3) or from non-EPA entities (Table 4). Each table documents the status of the IRIS record for the chemical in question, and to the extent possible, summarizes the reason given by the respondent for its nomination.

While not specifically solicited in 66 FR 37958, Tables 5 and 6 provide similar information for nominated chemicals that are already undergoing evaluation or are scheduled.

Summary of Findings

A total of 127 chemicals and 13 broad classes of chemicals were nominated for possible IRIS assessments when responses from all sources (EPA and non-EPA) were taken into account. These included 68 chemicals and chemical classes nominated by EPA Program Offices and Regions, and 110 by those non-EPA governmental, states, companies, trade organizations and

public interest groups responding to 66 FR 37958.[1] Among the 127 chemicals were 10 individually nominated polycyclic aromatic hydrocarbons (PAHs). EPA initiated an IRIS assessment of PAHs as they occur together in complex mixtures in FY2002. Accordingly, when PAHs were considered as a chemical class rather than as individual chemicals in keeping with EPA's plans for assessing PAHs, the total number of individual chemicals nominated was 117, and the total number of chemical classes nominated was 14.

Of the 140 nominated chemicals and chemical classes, 69 (49 percent) had no record on IRIS.

The most heavily represented categories of chemicals were pesticides and herbicides (29 nominations); petroleum fractions and constituents (18); chemical warfare agents, explosives, and their degradation products (15); chlorinated hydrocarbons (13); metals (11); polycyclic aromatic hydrocarbons (10); and the phthalates (6).

Nominated chemical classes that are listed in Tables 3 and 4 as a single entry include brominated fire retardants (polychlorinated diphenyl ethers), polychlorinated naphthalenes, acetanilide herbicide analytes, diesel range organics, gasoline range organics, petroleum hydrocarbons (aliphatic fractions), petroleum hydrocarbons (aromatic fractions), petroleum hydrocarbons (bulk), triazine metabolites, Clean Air Act priority pollutants, biological contaminants, radionuclides, and pharmaceuticals and their metabolites.

The most common reasons given by EPA respondents for nominating a chemical to IRIS were (1) the frequency at which a substance was detected at contaminated sites and (2) the availability of a provisional assessment from another Program office. Additional reasons were (3) to support anticipated rule-making, (4) to support Agency and/or state implementation priorities, (5) the availability of more recent toxicological information, and (6) children's health concerns.

Non-agency respondents most frequently cited (1) the widespread appearance of a chemical at contaminated sites and in groundwater, (2) a chemical's potential to bioaccumulate, (3) the special interest of a respondent for a particular chemical or group of chemicals, (4) the existence of new toxicological information or a provisional assessment, and (5) the existence of IRIS records with no quantitative toxicity values or from which some toxicity values were either missing or withdrawn.

[1] The number of nominations exceeds the total number of chemicals and chemical classes because some were nominated by both EPA and non-EPA respondents.

When all of the nominated chemicals listed in Tables 3 and 4 are sorted by number of requestors, the rank-ordered list provides a rough index of the priority assigned to chemicals by respondents. This evaluation is presented in Exhibit 1.

Exhibit 1. IRIS Nominations According to Incidence: Responses by EPA Regions, Program Offices, And the Public* in Response to 66 FR 37958

- Lead (8)
- 1,1,1-Trichloroethane (5)
- Aluminum, Benz(a)anthracene, Chrysene, Dibenzofuran, Naphthalene, Polybrominated diphenyl ethers (PDPE), 1,2,4-Trimethylbenzene, and 1,3,5-Trimethylbenzene (4 each)
- Benzo(b)fluoranthene, Benzo(k)fluoranthene, Benzo(g,h,i)perylene, sec-Butylbenzene, Carbazole, Chloromethane, Cobalt, Dibenz(a,h)anthracene, cis-1,2-Dichloroethylene, Di-n-octyl phthalate, 2-Hexanone, Indeno(1,2,3-cd)pyrene, Iron, Isopropyltoluene, Lindane, 2-Methyl naphthalene, 4-Methylphenol, Phenanthrene, and 1,2,3-Trichloropropane (3 each)
- Acrylonitrile, 4-Amino-2,6-dinitrotoluene, Atrazine, bis(2-Chloroisopropyl)ether, tert-Butanol, n-Butylbenzene, Chromium VI, p,p-DDD, p,p-DDE, p,p-DDT, 2,4-D, 1,2-Dibromo-3-chloropropane, Dibutyl phthalate, 1,1-Dichloroethane, 1,2-Dichloropropane, 4,6-Dinitro-2-methylphenol, Ethalfluralin, n-Hexane, Propionaldehyde, Methyl acetate, 4-Nitrophenol, 1,1,2,2-Tetrachloroethane, 2,2,4-Trimethylpentane, and Vanadium (2 each)
- 87 other substances or compound classes received a single nomination

* All non-U.S. EPA respondents to 66 FR 37958 including states, other U.S. governmental agencies, trade organizations, companies and private individuals

The comment entry citing the "IRIS lit. search project" in Tables 3 and 4 identifies 54 compounds nominated for IRIS evaluation that have also been evaluated in an on-going literature screening project undertaken by the IRIS Program. This screening-level study provides an examined the availability of more up-to-date toxicological information for 460 IRIS chemicals. The project involved the screening-level review of secondary sources of information such as documents produced by other EPA programs and offices, and summaries and reviews produced by other scientific agencies such as the International Agency for Research on Cancer (IARC) and the Agency for Toxic Substances and Disease Registry (ATSDR). In addition, electronic databases such as TOXLINE, MEDLINE, and CANCERLIT were searched for titles and abstracts of recent toxicological studies of the subject compounds. More recent studies than those summarized currently on IRIS were thought likely to exist for 21 of the 54 nominated chemicals.

U.S. EPA Program Offices and Regions also made 32 nominations of chemicals and chemical classes that are currently undergoing, or are scheduled for, IRIS evaluation (Table 5). Thirty two such nominations also were received from the public (Table 6). While not specifically solicited in 66 FR 37958, the 37 chemicals and 4 chemical classes[1] are listed here to indicate the extent of reiterated support for IRIS evaluations in progress.

[1] The number of nominations exceeds the total number of chemicals and chemical classes because some were nominated by both EPA and non-EPA respondents.

2.3. Responses to General Questions on IRIS Needs

Tables 7, 8 and 9 summarize responses to the three general questions posed to EPA Program Offices and the Regions, or to the public through 66 FR 37958 (Questions 1, 4, and 5 as listed on pages 1 and 2 of the Introduction). Specific findings and trends to emerge from these responses are summarized below.

2.3.1. How Do You/Does Your Organization Use IRIS? What Actions or Decisions are Based on Information in IRIS?

Of the 2 EPA entities and 13 state, industry, or private entities (Table 7) that responded to this question, there was overwhelming agreement on the primacy of the information on IRIS as a source of consensus information on the potential health hazards associated with environmental contaminants, as well as a source of quantitative toxicity values for incorporation into human health evaluations as part of the baseline risk assessment paradigm. Respondents consistently stated that IRIS evaluations were critical tools for quantitative risk analysis, the development of site-specific cleanup goals, and for setting criteria or standards by state agencies. One trade organization, however, considered the IRIS record for their chemical of interest to be of little utility because they perceived it to be incomplete, out-of-date, and unreflective of the most recently available toxicological information on that compound.

2.3.2. What Additional Types of Substance-Specific Agency Consensus Information Would You Like to Have on IRIS? For Example, EPA Is Considering Adding Consensus Health Assessments for Exposures of Less Than Chronic Duration, Such as Acute and Possibly Subchronic Exposures. Would These Types of Information Be of Value to You? If So, How Important Would This Information Be to You in Comparison to Having Updated Information on Chronic Health Effects?

This question elicited 6 responses from U.S. EPA Program Offices and Regions and 12 responses from other public and private entities (Table 8). As illustrated in Exhibit 2, three (50 percent) U.S. EPA respondents strongly endorsed the suggested addition of less-than-chronic toxicity information to IRIS records, compared to two (33 percent) who considered the information useful but secondary to IRIS' primary goal of updating and adding to our knowledge of the chronic toxicity of target compounds. Though no Agency respondent unreservedly opposed the suggestion, one endorsed it only in guarded terms, stressing the importance of adding chronic toxicity information on new chemicals as IRIS' primary mission. A similar distribution of opinion was evident among non-EPA public and private respondents, seven (58 percent) of whom unreservedly endorsed the suggestion, compared to three (25

percent) who provided qualified approval, one (8 percent) who endorsed it only in guarded terms and one (8 percent) who strongly opposed the suggestion. The latter respondent cited the danger that resources would be channeled away from the database's primary mission of adding and updating chronic toxicity information for risk assessments.

Exhibit 2. The Utility of Adding Acute/Subchronic Toxicity Evaluations to IRIS: EPA and Non-EPA Responses

Response	EPA	Non-EPA
Endorsed	3	7
Qualified Endorsement	2	3
Guarded Endorsement	1	1
Opposed	0	1

Six respondents (three Agency and three other public and private) made suggestions for other categories of information they would like to see on IRIS. For example, three EPA respondents stressed the importance of including data relevant to children's health issues. Other suggestions called for the inclusion of (1) mechanistic data for carcinogens, (2) developmental information, (3) a compound's regulatory history, (4) the name and address of an Agency technical contact person, (5) interim or provisional toxicity evaluations in the absence of evaluations that have gone through the IRIS consensus process, and (6) more complete dose/response data for non-cancer effects.

2.3.3. EPA Is Currently Testing Collaborative Efforts with External Parties on the Development of Assessments for IRIS (66 FR 11165). The Purpose Is to Involve the Scientific Knowledge and Capability of Organizations Outside of EPA to Improve the Quality of IRIS Supporting Documents. External Parties May Include Other Government Agencies, Industries, Universities, Professional Organizations, and Other Non-Governmental Organizations. EPA Will Evaluate the Efficiency of the Process and Quality of Documents Produced to Determine if the Collaborative Program Should Be Expanded. Do You Favor EPA's Collaboration with External Parties as a Means of Developing Assessments for IRIS? If So, How Could This Collaboration Be Conducted?

This question elicited 5 responses from EPA entities and 12 responses from non-EPA sources (Table 9). In like manner to the responses to Question 4, these can be broken out into

categories reflecting either unqualified approval, qualified or guarded endorsement, or opposition, as illustrated in Exhibit 3. This use of separate categories of less-than-complete endorsement attempts to capture inherent differences in the 10 of 17 (59%) responses that neither fully endorsed nor totally opposed the concept under consideration.

Exhibit 3. The Desirability of Agency-external Collaboration in Building IRIS: EPA and Non-EPA Responses

Response	EPA	Non-EPA
Endorsement	1	5
Qualified Endorsement	0	4
Guarded Endorsement	4	2
Opposed	0	1

As illustrated in Exhibit 3, a single EPA respondent gave the concept unreserved endorsement, a level of approval far lower than the 5 of 12 (42 percent) of non-EPA respondents who supported the suggestion. However, four (80%) Agency respondents gave the concept only guarded endorsement, although none were completely opposed. One Agency respondent pointed to the need to evaluate critically the outcome of the current pilot scheme for Agency-external party collaboration.

As mentioned above, a plurality of non-EPA (5 of 12) endorsed the concept of Agency-external party collaboration, although a number cited conflict of interest concerns in any expanded involvement of external parties in building IRIS. However, the possibility of establishing a framework in which impartiality and scientific rigor could be maintained was recognized by several respondents. Such a framework would include independent analysis, transparent peer review, and public participation, all under the overall control of the Agency. One non-EPA respondent was unreservedly opposed to any involvement of external parties in IRIS building.

2.4. Additional Suggestions Made by Respondents

In addition to answering the questions posed as part of the Agency's Needs Assessment for IRIS, a number of respondents provided comments on other aspects of the IRIS Program with which they were concerned. These comments are summarized in the following paragraphs.

One regional office suggested that a procedure be developed to address the quantitative toxicity of Tentatively Identified Compounds (TICs), thereby allowing their incorporation into

the standard risk paradigm. The region and one state pointed out the desirability of establishing a page on the IRIS website that would give additional information on the Federal Register list of chemicals that are planned for, or already are, undergoing review. Pertinent information would include updates of the progress of each review and the telephone number/e-mail address of a chemical manager/technical contact. The region also suggested that, where possible, quantitative toxicity information on a chemical should be given in ranges, including additional information on the level within the range that is most appropriate for various exposure scenarios. In the opinion of the respondents, the availability of such information would facilitate the establishment of guidelines/criteria and decision-making in risk management.

A number of respondents offered the opinion that the pace of IRIS updates is too slow. These respondents include an environmental advocacy group, and four trade and industry groups primarily concerned with updates to substances in which they have an interest. In the former case, the group linked the outdated status of many IRIS entries to the slow pace of IRIS updates, using the dioxin reassessment as an example. The four industry and trade groups advocated the updating of IRIS records of chemicals in which they have an interest. In some cases, additional studies or more recent data were cited to justify the request for reassessment. One company submitted an alternative toxicological review to support the contention that the evaluations and numerical values on IRIS for its chemical of interest are flawed.

One trade organization submitted an 11-page framework for how, in their opinion, the overall IRIS process and the quality of its documentation could be improved. Justification for the framework was based on a critique of the current approach and the conclusion that "shortcomings significantly undermine the credibility of the IRIS system and compromise the use of good science at EPA." In general terms the respondent's concept of an improved IRIS process would involve (1) bringing IRIS records up-to-date by updating parts of individual assessments as new information becomes available, (2) applying a "weight-of-evidence" approach to the latest relevant studies and methodologies, (3) rigorous and transparent peer review, (4) establishing priorities according to the needs of regulatory decision-making, (5) setting criteria for marking the reliability of each file according to the quality and age of the information within it, and (6) increased funding and staffing to cover the increased workload. While making a number of recommendations for improvements within the categories outlined above, the respondent recognized that changes along the lines envisioned would be expensive. However, a number of measures were proposed to mitigate this consequence, principal among which was that producers of chemicals and other interested parties should be given the opportunity to develop and submit toxicological reviews to IRIS, with Agency personnel centering their activities on reviewing the submissions and analyses submitted by outside parties. The respondent pointed to the initial

experiments undertaken by the EPA to establish links between the Agency and outside parties for IRIS building and wished to see such collaboration greatly expanded and "institutionalized in the form of a new approach that effectively and efficiently leverages private resources."

In a related submission, another trade organization endorsed the above recommendations, and drew attention to a case where a discrepancy exists between an IRIS record and an evaluation of the same chemical developed by another program office. This discrepancy was cited as most likely an example of Agency inefficiency rather than scientific disagreement between offices. Discrepancies such as these were also highlighted in additional comments made by another respondent, who emphasized the waste of resources inherent in several offices of the Agency carrying out parallel evaluations on the same compound. This observation was expanded into the general point that the Agency should develop a systematic program for updating IRIS with the goal of keeping all assessments current and credible. The respondent recognized that insufficiency of funds lies at the heart of IRIS' perceived problems, and considered that collaborative efforts between the Agency and external parties would only ameliorate this condition in part. Major additional governmental funding would be required.

Another trade organization submitted comments on EPA's Federal Register notice and request for information on IRIS that stressed the inadvisability of expanding and updating IRIS until the program expands peer review and improves the overall scientific quality of IRIS submissions. In the opinion of this respondent, two improvements could be achieved by: (1) incorporating the tenets of the Agency's Proposed Guidelines for Carcinogen Risk Assessment (61 FR 17960) into all toxicity evaluations for IRIS, and (2) explicitly addressing data variability and uncertainty as suggested in the Agency's 2000 report to Congress, *Characterization of Data Variability and Uncertainty: Health Effects Assessments in the Integrated Risk Information System (IRIS)*. Incremental steps to achieve such improvements might include (1) developing a standardized approach to handling variability and uncertainty in IRIS assessments, (2) clarifying data quality issues in IRIS assessments, (3) giving further consideration to the appropriateness of the animal model used to estimate exposure conditions and applicable end points of relevance to humans, and (4) explicitly addressing the issue of whether, in all cases, human beings are more sensitive to the effects of a toxicant than are the experimental animals used to model its effects.

One state environmental agency suggested the creation of an Agency-sponsored "bulletin board" on which all interested parties could post new information on the toxicity of chemicals of interest.

Table 1. Respondents from U.S. EPA Program Offices and Regions

Office of Transportation and Air Quality (OTAQ)

Office of Air Quality Planning and Standards (OAQPS)

Office of Children's Health Protection (OCHP)

Office of Prevention, Pesticides, and Toxic Substances (OPPT)

Office of Pesticide Programs (OPP)

Office of Solid Waste and Emergency Response (OSWER)

Office of Policy, Economics, and Innovation (OPEI)

National Center for Environmental Assessment - Cincinnati (NCEA-Cin)

National Center for Environmental Assessment - Immediate Office (NCEA-IO)

Office of Water (OW)

EPA Region 1 - Boston, MA

EPA Region 2 - New York, NY

EPA Region 4 - Atlanta, GA

EPA Region 5 - Chicago, IL

EPA Region 7 - Kansas City, MO

EPA Region 8 - Denver, CO

EPA Region 10 - Seattle, WA

Table 2. Public Respondents to the EPA's Needs Assessment

U.S. Army Center for Health Promotion and Preventive Medicine (USACHPPM)

U.S. Army Corps of Engineers (USACE)

Alaska Department of Environmental Conservation (Alaska DEC)

Illinois Environmental Protection Agency (Illinois EPA)

Minnesota Department of Environmental Health (Minnesota DEH)

Minnesota Pollution Control Agency

New Jersey Department of Environmental Protection (New Jersey DEP)

New Jersey Division of Science, Research, and Technology

Pennsylvania Department of Environmental Protection (Pennsylvania DEP)

Virginia Department of Environmental Quality (Virginia DEQ)

Industry Task Force II on 2,4-D Research Data

Acrylonitrile Group, Inc.

American Chemistry Council and Its Olefins Panel (ACC)

American Crop Protection Association (ACPA)

Basic Acrylic Monomer Manufacturers, Inc. (BAMM)

Chemical Products Corporation (CPC)

Hercules, Inc.

Legal Environmental Assistance Foundation, Inc. (LEAF)

Methacrylate Producers Association. Inc.

NewFields, Inc.

Synthetic Organic Chemical Manufacturers' Association (SOCMA)

Toxicity Excellence for Risk Assessment (TERA)

Table 3. EPA Office and Regional IRIS Nominations for FY02

Chemical Name	Requestor	What's on IRIS Now?	Comments
Acrylonitrile***	OAQPS	On-line. Posted RfC, WOE, SF_o and IUR	This chemical is nominated because its IRIS record predates the new guidelines for carcinogenic risk assessment and because more recent toxicological data are available. Regulatory decision-making is anticipated.
Aluminum (total)	Region 2	No record	Frequently detected at Federal and State sites across the country. IRIS carries a record for aluminum phosphide.
Atrazine***	OPP	On-line. Posted RfD	IRIS lit. search project: significant new noncancer study data may be available.**
Benz(a)anthracene (1,2-Benzanthracene)	OSWER Region 2	On-line. Posted WOE, No toxicity values	*Assessment of PAHs as a group in progress FY2002. This and other OSWER nominations are based on public comments on the Hazardous Waste Identification Rule (HWIR) and the Inorganic Waste Listing, and on their widespread occurrence at Superfund sites.
Benzo(b)fluoranthene (3,4-Benzofluoranthene)	Region 2	On-line. Posted WOE, No toxicity values	*Frequently detected at Federal and State sites across the country. Assessment of PAHs as a group in progress FY2002.
Benzo(ghi)perylene	Region 2	On-line. Posted WOE, No toxicity values	*Frequently detected at Federal and State sites across the country. Assessment of PAHs as a group in progress FY2002.
Benzo(k)fluoranthene	Region 2	On-line. Posted WOE, No toxicity values	*Frequently detected at Federal and State sites across the country. Assessment of PAHs as a group in progress FY2002.
Bis(2-chloroisopropyl)ether	Region 2	On-line. Posted RfD	Frequently detected at Federal and State sites across the country. IRIS lit. search project: no significant new study data were identified.**
tert-Butanol	Region 2	No record	Frequently detected at Federal and State sites across the country.

Chemical Name	Requestor	What's on IRIS Now?	Comments
Butyl benzyl phthalate	OSWER	On-line. Posted RfD, WOE	Nominated on the basis of public comments on the Hazardous Waste Identification Rule (HWIR) and the Inorganic Waste Listing, or on the basis of frequent occurrence at Superfund sites. IRIS lit. search project: significant new noncancer study data may be available.**
Captan	OPP	On-line. Posted RfD	
Carbazole	Region 2	No record	Frequently detected at Federal and State sites across the country.
Chlorine	NCEA-IO	On-line. Posted RfD	NCEA Cincinnati provisional assessment contains a route-specific assessment not available on IRIS. IRIS lit. search project: no significant new study data were identified.**
Chlorobenzene	NCEA-IO	On-line. Posted RfD, WOE	NCEA Cincinnati provisional assessment contains a route-specific assessment not available on IRIS. IRIS lit. search project: no significant new study data were identified.**
Chlorobenzylidene malononitrile	Region 8	No record	This compound (tear gas) has been the subject of requests for guidance in regard to its possible chronic health effects.
Chloromethane (Methyl chloride)	Region 2	On-line. Posted RfC, WOE	Frequently detected at Federal and State sites across the country. Record is dated 07/17/2001. IRIS lit. search project: no significant new study data were identified.**
Chromium VI	OPEI	On-line. Posted RfD, RfC, WOE, IUR	Although this record was last updated 09/03/1998, the requestor points to recently published epidemiological data now available for consideration. IRIS lit. search project: no significant new study data were identified.**
Chrysene	OSWER, Region 2	On-line. Posted WOE	*Frequently detected at Federal and State sites across the country. Assessment of PAHs as a group in progress FY2002.
Cobalt (total)***	Region 2	No record	Frequently detected at Federal and State sites across the country.

Chemical Name	Requestor	What's on IRIS Now?	Comments
p,p-DDD	NCEA-Cin. Region 4	On-line. Posted WOE, SF_o	The respondent mentioned that new data and NCEA-Cin provisional values are available for this compound and its analogue, DDE. However, no significant new study data were identified in the IRIS lit. search project.** The compound, which is a priority in Region IX and at a cleanup site in California, is persistent in the environment and may present a children's health concern.
p,p-DDE	NCEA-Cin. Region 4	On-line. Posted WOE, SF_o	The compound, which is a priority in Region IX and at a cleanup site in California, is persistent in the environment and may present a children's health concern. IRIS lit. search project: no significant new study data were identified.**
DDT	NCEA-Cin. Region 4	On-line. Posted RfD, WOE, SF_o, IUR	The compound, which is a priority in Region IX and at a cleanup site in California, is persistent in the environment and may present a children's health concern. IRIS lit. search project: significant new noncancer and cancer study data may be available.**
Di(2-ethylhexyl)adipate	OW	On-line. Posted RfD, WOE, SF_o	U.S. EPA is under a settlement agreement to reconsider the available scientific information on DEHA.
Di-n-octyl phthalate	OSWER, Region 2	No record	Frequently detected at Federal and State sites across the country.
Dibenz(a,h)anthracene	Region 2	On-line. Posted WOE	*Frequently detected at Federal and State sites across the country. Assessment of PAHs as a group in progress FY2002.
Dibenzofuran	NCEA-IO Region 2	On-line. Posted WOE, No toxicity values	Frequently detected at Federal and State sites across the country. NCEA Cincinnati provisional assessment contains route-specific assessment not available on IRIS. IRIS lit. search project: no significant new study data were identified.**
1,2-Dibromo-3-chloropropane	Region 2	On-line. Posted RfC	Frequently detected at Federal and State sites across the country. IRIS lit. search project: no significant new study data were identified.**

Chemical Name	Requestor	What's on IRIS Now?	Comments
Dibutyl phthalate***	OSWER Region 8	On-line. Posted RfD, WOE	IRIS lit. search project: significant new noncancer study data may be available.** The compound is a program implementation priority for Superfund remedial investigations.
1,1-Dichloroethane	Region 2	On-line. Posted WOE	Frequently detected at Federal and State sites across the country. IRIS lit. search project: no significant new study data were identified.**
cis-1,2-Dichloroethylene	Region 7 Region 2	On-line. Posted WOE, No toxicity values	Frequently detected at Federal and State sites across the country. Region 5 identifies the compound as a priority. IRIS lit. search project: no significant new study data were identified.**
1,2-Dichloropropane	Region 2	On-line. Posted RfC	Frequently detected at Federal and State sites across the country. IRIS lit. search project: no significant new study data were identified.**
Diethyl phthalate	OSWER	On-line. Posted RfD, WOE	Nominated on the basis of public comments on the Hazardous Waste Identification Rule (HWIR) and the Inorganic Waste Listing, or on the basis of frequent occurrence at Superfund sites. IRIS lit. search project: significant new noncancer study data may be available.**
Dimethyl phthalate	OSWER	On-line. Posted WOE, No toxicity values	Nominated on the basis of public comments on the Hazardous Waste Identification Rule (HWIR) and the Inorganic Waste Listing, or on the basis of frequent occurrence at Superfund sites. IRIS lit. search project: no significant new study data were identified.**
Dimethylarsenic acid (Cacodylate)	Region 10	On-line. Posted WOE, No toxicity values	The compound is a state and industry priority. In addition, OPPT has completed an assessment. IRIS lit. search project: significant new cancer study data may be available.**
4,6-Dinitro-2-methylphenol (4,6-Dinitro-o-cresol)	Region 2	No record	Frequently detected at Federal and State sites across the country.
Ethalfluralin***	OPP	No record	

Chemical Name	Requestor	What's on IRIS Now?	Comments
1,2,4,5,7,8-Hexachloroxanthene	Region 1	No record	The requestor identifies the chemical is a priority at a Rhode Island Superfund site. There is a likelihood of bioaccumulation.
n–Hexane***	NCEA-IO	On-line. Posted RfC	IRIS lit. search project: significant new noncancer study data may be available.** NCEA Cincinnati provisional assessment contains information that is substantively different from IRIS and a route-specific assessment not available on IRIS.
2-Hexanone	Region 2	No record	Frequently detected at Federal and State sites across the country.
Hydrogen cyanide***	OW	On-line. Posted RfD, RfC	Newer data and an OST/OW criteria document exist for hydrogen cyanide. Additionally, evaluation of the compound is required for 6-year review under the SDWA and for a Disinfectants and Disinfectant-Byproducts Stage III Rule Proposal.
Indeno(1,2,3-cd)pyrene	Region 2	On-line. Posted WOE, No toxicity values	*Frequently detected at Federal and State sites across the country. Assessment of PAHs as a group in progress FY2002.
Isobutyl alcohol	OSWER	On-line. Posted RfD	Nominated on the basis of public comments on the Hazardous Waste Identification Rule (HWIR) and the Inorganic Waste Listing, or on the basis of frequent occurrence at Superfund sites. IRIS lit. search project: significant new noncancer study data may be available.**
Lead	OPEI OCHP Region 2 Region 4 Region 8	On-line. Posted WOE, No toxicity values	Updating the existing record (for "lead and compounds") is necessary in light of recent studies on the element's possible mode of action and of increasing knowledge about an apparent association between lead in bone and hypertension in adults. In addition, well-recognized children's health concerns relate to this element. IRIS lit. search project: significant new noncancer study data may be available.**

Chemical Name	Requestor	What's on IRIS Now?	Comments
Lindane (gamma-HCH) (gamma-BHC)***	OPP Region 2	On-line. Posted RfD, WOE	Frequently detected at Federal and State sites across the country.
Manganese	OSWER	On-line. Posted RfD, RfC, WOE	Nominated on the basis of public comments on the Hazardous Waste Identification Rule (HWIR) and the Inorganic Waste Listing, or on the basis of frequent occurrence at Superfund sites. IRIS lit. search project: significant new noncancer study data may be available.**
Methomyl***	OPP	On-line. Posted RfD	IRIS lit. search project: no significant new study data were identified.**
2-Methylnaphthalene***	Region 7	No record	Region 7 identifies the compound as a priority in its states.
Methyl acetate	Region 2	No record	Frequently detected at Federal and State sites across the country.
Methyl ethyl ketone***	OSWER	On-line. Posted RfD, RfC, WOE	Nominated on the basis of public comments on the Hazardous Waste Identification Rule (HWIR) and the Inorganic Waste Listing, or on the basis of frequent occurrence at Superfund sites.
4-Methylphenol (p-cresol)	Region 2	On-line. Posted WOE, No toxicity values	Frequently detected at Federal and State sites across the country. Posted RfD was withdrawn 08/01/1991. IRIS lit. search project: significant new noncancer study data may be available.**
Naphthalene***	OAQPS OSWER OTAQ Region 1	On-line. Posted RfD, RfC, WOE	Although the current record is dated 09/17/1998, a recently published NTP study found evidence of carcinogenicity in rats and mice. This hazardous air pollutant is a priority for the Air Toxics Program, being one of 188 Title 1 chemicals and 21 mobile source air toxics. The compound is detected in soils at most Superfund sites.
4-Nitrophenol	Region 2	On-line. No toxicity values	Frequently detected at Federal and State sites across the country. IRIS lit. search project: no significant new study data identified.**

Chemical Name	Requestor	What's on IRIS Now?	Comments
N-Nitrosodimethylamine	NCEA-IO	On-line. Posted WOE, SF_o, IUR	NCEA Cincinnati provisional assessment contains a route-specific assessment not available on IRIS. IRIS lit. search project: significant new cancer study data may be available.**
N-Nitrosodiphenylamine	NCEA-IO	On-line. Posted WOE, SF_o	NCEA Cincinnati provisional assessment contains a route-specific assessment not available on IRIS. IRIS lit. search project: no significant new study data were identified.**
Perfluorooctane sulfonate***	OPPT	No record	This chemical is identified as the subject of voluntary and regulatory action within OPPT, and as a priority within Region 3 and the State of Virginia.
Perfluorooctanoic acid and its ammonium salt***	OPPT	No record	This chemical is identified as the subject of voluntary and regulatory action within OPPT, and as a priority within Region 3 and the State of Virginia.
Phenanthrene	Region 5	On-line. Posted WOE, No toxicity values	*Assessment of PAHs as a group in progress FY2002. The requestor points to the compound's widespread detection at contaminated sites and its heavy release from industrial facilities. The chemical is on the U.S.-Canada Binational Agreement List for chemicals of concern in the Great Lakes region.
Propachlor***	OPP	On-line. Posted RfD	
Propionaldehyde	OAQPS OTAQ	No record	The compound is one of the Title I 188 hazardous air pollutants, and is present in motor vehicle exhausts.
1,1,2,2-Tetrachloroethane	NCEA-IO	On-line. Posted WOE, SF_o, IUR	NCEA Cincinnati provisional assessment contains a route-specific assessment not available on IRIS. IRIS lit. search project: no significant new study data were identified.**
Thallium***	OW	No record	Separate records exist for thallium oxide, thallium acetate, thallium carbonate, thallium chloride, thallium nitrate, thallium selenite, thallium(I) sulfate. Assessing newer data on the reproductive/developmental toxicity of thallium would be important to the compound's National Primary Drinking Water Regulation (NPDWR) six-year review.

Chemical Name	Requestor	What's on IRIS Now?	Comments
1,1,1-Trichloroethane***	NCEA-IO Region 2 Region 8	On-line. Posted WOE, No toxicity values	Frequently detected at Federal and State sites across the country. IRIS lit. search project: significant new noncancer study data may be available.** NCEA Cincinnati provisional assessment contains a route-specific assessment not available on IRIS. The chemical is a program implementation priority for Superfund remedial investigations Posted RfD was withdrawn 02/01/1996.
1,2,3-Trichloropropane***	NCEA-IO	On-line. Posted RfD	NCEA Cincinnati provisional assessment contains a route-specific assessment not available on IRIS. IRIS lit. search project: significant new noncancer study data may be available.**
1,1,2-Trichloroethane	Region 7	On-line. Posted RfD, WOE, SF_o, IUR	Region 7 identifies the compound as a priority in its states. IRIS lit. search project: no significant new study data were identified.**
2,2,4-Trimethylpentane	OAQPS OTAQ	On-line. No toxicity values	IRIS lit. search project: no significant new study data identified.** The requestor identifies the compound as a mobile source air toxic.
Vanadium (total)	Region 2	No record	Frequently detected at Federal and State sites across the country. IRIS carries a record for vanadium pentoxide.

Chemical Name	Requestor	What's on IRIS Now?	Comments
CHEMICAL CLASSES			
Brominated flame retardants (BFRs or PBDEs, including updating decabromodiphenyl ether, octabromodiphenyl ether, pentabromodiphenyl ether)***	OPEI	On-line records for each analogue. Posted RfDs and WOEs for each analogue	These compounds are nominated because of their persistence and their potential significance for children's health. IRIS lit. search project (for penta-analogue): no significant new study data were identified.**
Polychlorinated naphthalenes (PCNs)	Region 1	On-line record for beta-chloronaphthalene with a posted RfD	The compounds are priorities at Superfund federal facility sites and military bases. IRIS lit. search project (for beta-chloronaphthalene): no significant new study data were identified.**

RfD = reference dose, RfC = reference concentration, WOE = weight of evidence of carcinogenicity, SF_o = oral slope factor, IUR = inhalation unit risk.
* Polycyclic aromatic hydrocarbon (PAH).
** Refers to U.S. EPA's literature screening project to assess the currency of the IRIS database. Currently, 460 of the chemicals on IRIS have been screened (see text).
Note: "What's on IRIS Now?" and IRIS literature screening results are current as of July 2003.
*** Substance has been added to EPA's IRIS agenda in FY 2002 or FY 2003.

Table 4. Public IRIS Nominations for FY02

("Public" refers to all non-EPA respondents to FR Notice 66 FR 37958, including other governmental agencies, organizations, companies and private individuals)

Compound	Requestor	What's on IRIS Now?	Comments
Acenaphthylene	Illinois EPA	On-line. Posted WOE, No toxicity values	*Assessment of PAHs as a group to commence FY2002. Toxicity values are required for this frequently detected contaminant.
Acetonitrile	Minnesota DEH	On-line. Posted RfC, WOE	Record is dated 03/03/1999. The withdrawal of a previous RfD has created a problematic data gap for Minnesota DEH. IRIS lit. search project: no significant new study data were identified.**
Acrylic acid	BAMM	On-line. Posted RfD, RfC	BAMM points to an available physiologically based pharmacokinetic (PBPK) model for this compound. IRIS lit. search project: significant new noncancer study data may be available.**
Acrylonitrile***	Acrylonitrile Group, Inc.	On-line. Posted RfC, WOE, SF_o, IUR	AN considers the current IRIS record and its quantitative evaluations to be out-of-date because more recent health effects information is available. IRIS lit. search project: significant new cancer study data may be available.**

Compound	Requestor	What's on IRIS Now?	Comments
Aluminum	New Jersey DEP Virginia DEQ Minnesota DEH	No record	IRIS carries a record for aluminum phosphide. Virginia DEQ has used NCEA provisional toxicity values to assess this element. However, IRIS values are needed to support remedial decisions.
2-Amino-4,6-dinitrotoluene	USACE	No record	This compound is one of several explosives or explosive degradation products of interest to the USACE.
4-Amino-2,6-dinitrotoluene	USACE Minnesota DEH	No record	This compound, which has been detected in groundwater in Minnesota, is one of several explosives or explosive degradation products of interest to the USACE.
Anthracene	USACE	On-line. Posted RfD, WOE	*Assessment of PAHs as a group in progress FY2002. While this and other PAHs are frequently detected at USACE sites, the requestor considers a high level of uncertainty to be associated with current extrapolation methods from benzo(a)pyrene.
Atrazine	Minnesota DEH	On-line. Posted RfD	IRIS lit. search project: significant new noncancer study data may be available.** Minnesota DEH identifies atrazine as an example of a chemical for which there are inconsistences among evaluations from different agency offices.

Compound	Requestor	What's on IRIS Now?	Comments
Barium	CPC, Inc.	On-line. Posted RfD, WOE	Record is dated 01/21/1999. CPC considers the existing barium assessment to be flawed and has submitted an alternative toxicological review. IRIS lit. search project: no significant new study data were identified.**
Benzo(a)anthracene	USACE New Jersey DEP	On-line. Posted WOE, No toxicity values	*Assessment of PAHs as a group in progress FY2002. Though this and other PAHs are frequently detected at USACE sites, high uncertainty is associated with current extrapolation methods from benzo(a)pyrene.
Benzo(b)fluoranthene	USACE New Jersey DEP	On-line. Posted WOE, No toxicity values	*Assessment of PAHs as a group in progress FY2002. Though this and other PAHs are frequently detected at USACE sites, high uncertainty is associated with current extrapolation methods from benzo(a)pyrene.
Benzo(k)fluoranthene	USACE New Jersey DEP	On-line. Posted WOE, No toxicity values	*Assessment of PAHs as a group in progress FY2002. Though this and other PAHs are frequently detected at USACE sites, high uncertainty is associated with current extrapolation methods from benzo(a)pyrene.
Benzo(g,h,i)perylene	New Jersey DEP Illinois EPA	On-line. Posted WOE, No toxicity values	*Assessment of PAHs as a group set to commence FY2002. Toxicity values are required for this frequently detected contaminant.
Bis(2-chloroisopropyl)ether	New Jersey DEP	On-line. Posted RfD	IRIS lit. search project: no significant new study data were identified.**
Bromobenzene***	Minnesota DEH	No record	

Compound	Requestor	What's on IRIS Now?	Comments
tert-Butanol	New Jersey DEP	No record	
n-Butylbenzene	Illinois EPA Minnesota DEH	No record	The requestors require toxicity values for this and other alkylbenzenes because of the large number of petroleum-related cleanup projects overseen by the state agencies.
sec-Butylbenzene	Illinois EPA Minnesota DEH Alaska DEC	No record	The requestors require toxicity values for this and other alkylbenzenes because of the large number of petroleum-related cleanup projects overseen by the state agencies.
tert-Butylbenzene	Illinois EPA	No record	The requestors require toxicity values for this and other alkylbenzenes because of the large number of petroleum-related cleanup projects overseen by the state agencies.
Carbazole	Minnesota DEH New Jersey DEP	No record	This compound has been detected in groundwater in Minnesota.
2-Chloroethyl vinyl ether	Pennsylvania DEP	No record	An assessment is needed to develop soil and groundwater cleanup standards under Pennsylvania DEP's Land Recycling and Cleanup Program (Act 2).
Chloromethane (Methyl chloride)	Minnesota DEH New Jersey DEP	On-line. Posted RfC, WOE	Record is dated 07/17/2001. IRIS lit. search project: no significant new study data were identified.**
Chromium VI	Minnesota Pollution Control Agency	On-line. Posted RfD, RfC, WOE, IUR	Last updated 09/03/1998. IRIS lit. search project: no significant new study data were identified.**

Compound	Requestor	What's on IRIS Now?	Comments
Chrysene	New Jersey DEP USACE	On-line. Posted WOE	*Assessment of PAHs as a group set to commence FY 2002. Though this and other PAHs are frequently detected at USACE sites, high uncertainty is associated with current extrapolation methods from benzo(a)pyrene.
Clomazone	Minnesota DEH	No record	This compound has been detected in groundwater in Minnesota.
Cobalt***	Minnesota DEH New Jersey DEP	No record	This element has been detected in groundwater in Minnesota.
Cyanazine	Minnesota DEH	On line. No toxicity values	RfD was withdrawn 03/01/1996. This compound has been detected in groundwater in Minnesota. IRIS lit. search project: significant new noncancer study data may be available.**
Cyclotetramethylenetretranitramine (HMX)	USACE	No record	This compound is one of several explosives or explosive degradation products of interest to the USACE.
Dalapon	Minnesota DEH	On-line. Posted RfD	This compound has been detected in groundwater in Minnesota. IRIS lit. search project: no significant new study data were identified.**
DCPA mono-acid (Dacthal)	Minnesota DEH	On-line. Posted RfD	IRIS lit. search project: no significant new cancer study data were identified.**
DCPA di-acid	Minnesota DEH	As above	This compound has been detected in groundwater in Minnesota.

Compound	Requestor	What's on IRIS Now?	Comments
delta-BHC	Minnesota DEH	On-line. Posted WOE, No toxicity values	This compound has been detected in groundwater in Minnesota. IRIS lit. search project: no significant new study data were identified.**
Diallate	Minnesota DEH	No record	This compound has been detected in groundwater in Minnesota.
Dibenz(a,h)anthracene	New Jersey DEP USACE	On-line. Posted WOE	*Assessment of PAHs as a group set to commence FY 2002. Though this and other PAHs are frequently detected at USACE sites, high uncertainty is associated with current extrapolation methods from benzo(a)pyrene.
Dibenzofuran	Minnesota DEH New Jersey DEP	On-line. Posted WOE, No toxicity values	NCEA Cincinnati provisional assessment contains route-specific assessment not available on IRIS. This compound has been detected in groundwater in Minnesota. IRIS lit. search project: no significant new study data were identified.**
1,2-Dibromo-3-chloropropane	New Jersey DEP	On-line. Posted RfC	The requestor uses a cancer evaluation from the agency's HEAST, but has no RfD. IRIS lit. search project: no significant new study data were identified.**
1,1-Dichloroethane	New Jersey DEP	On-line. Posted WOE	The requestor uses an RfD from the agency's HEAST but has no quantitative carcinogenicity assessment. IRIS lit. search project: no significant new study data were identified.**

Compound	Requestor	What's on IRIS Now?	Comments
cis-1,2-Dichloroethylene	New Jersey DEP	On-line. Posted WOE, No toxicity values	The requestor uses an RfD from the agency's HEAST. IRIS lit. search project: no significant new study data were identified.**
Dichlorofluoromethane	Minnesota DEH	No record	IRIS posts an oral RfD for the analog, Dichlorodifluoromethane.
2,4-Dichlorophenoxyacetic acid (2,4-D)	ACPA Industry Task Force II on 2,4-D Research Data	On-line. Posted RfD	IRIS lit. search project: significant new noncancer study data may be available.** ACPA notes current inconsistencies among EPA offices.
1,2-Dichloropropane	New Jersey DEP	On-line. Posted RfC	The requestor uses a cancer evaluation from the agency's HEAST, but has no RfD. IRIS lit. search project: no significant new study data were identified.**
2,2-Dichloropropane	Minnesota DEH	No record	
1,1-Dimethylhydrazine	Pennsylvania DEP	No record	An assessment is needed to develop soil and groundwater cleanup standards under Pennsylvania DEP's Land Recycling and Cleanup Program (Act 2).
4,6-Dinitro-2-methylphenol	New Jersey DEP	No record	The requestor uses an RfD from the agency's NCEA office but has neither qualitative nor quantitative carcinogenicity assessment.
Di-n-octyl phthalate	New Jersey DEP	No record	The requestor uses an RfD from the agency's HEAST but has neither qualitative nor quantitative carcinogenicity assessment.
Ethafluralin***	Minnesota DEH	No record	This compound has been detected in groundwater in Minnesota.

Compound	Requestor	What's on IRIS Now?	Comments
Ethylene glycol monobutyl ether	Minnesota Pollution Control Agency	On-line. Posted RfD, RfC, WOE	Record is dated 12/30/1999. The requestor lists the compound as one for which either new information is available or that detected amounts are close to levels of concern. IRIS lit. search project: no significant new study data were identified.**
Ethyl-S-diiospropyl amino ethyl methylphosphothiolate (VX)	USACE	No record	This compound is one of several militarily important chemicals of interest to USACE.
Famphur	Pennsylvania DEP	No record	An assessment is needed to develop soil and groundwater cleanup standards under Pennsylvania DEP's Land Recycling and Cleanup Program (Act 2).
n-Hexane***	Minnesota Pollution Control Agency	On-line. Posted RfC	IRIS lit. search project: significant new noncancer study data may be available.** NCEA Cincinnati provisional assessment contains information that is substantively different from IRIS and a route-specific assessment not available on IRIS.
2-Hexanone	Illinois EPA New Jersey DEP	No record	This compound is frequently detected at contaminated sites in Illinois.
Indeno(1,2,3-cd)pyrene*	New Jersey DEP USACE	On-line. Posted WOE, No toxicity values	Assessment of PAHs as a group in progress FY2002. Though this and other PAHs are frequently detected at USACE sites, high uncertainty is associated with current extrapolation methods from benzo(a)pyrene.

Compound	Requestor	What's on IRIS Now?	Comments
Iron	Pennsylvania DEP Minnesota DEH Virginia DEQ	No record	Virginia DEQ has used NCEA provisional toxicity values to assess this element. IRIS values are needed to support remedial decisions.
Isopropyl ether	Minnesota DEH	No record	This compound has been detected in groundwater in Minnesota.
Isopropyl toluene	Illinois EPA Alaska DEC Minnesota DEH	No record	The requestors require toxicity values for this compound because of the large number of petroleum-related cleanup projects overseen by the state agencies.
Lead	Virginia DEQ Minnesota DEH Pennsylvania DEP	On-line. Posted WOE, No toxicity values	Record is for "lead and compounds." Virginia DEQ points out that, in the absence of toxicity values, every detection of lead is of potential concern. IRIS lit. search project: significant new noncancer study data may be available.**
Lewisite	USACE	No record	This compound is one of several militarily important chemicals of interest to USACE.
D-Limonene	Minnesota DEH	On-line. No toxicity values	This compound has been detected in groundwater in Minnesota. IRIS lit. search project: no significant new study data identified.**
Lindane***	New Jersey DEP	On-line. Posted RfD, WOE	The requestor uses qualitative and quantitative carcinogenicity assessments from the agency's HEAST.
Lithium	Minnesota DEH	No record	This element has been detected in groundwater in Minnesota.

Compound	Requestor	What's on IRIS Now?	Comments
Maleic anhydride	Minnesota DEH	On-line. Posted RfD	Guidance on the health effects of this sensitizer is required by the requestor. IRIS lit. search project: significant new noncancer study data may be available.**
Methoxychlor***	Minnesota Pollution Control Agency	On-line. Posted RfD, WOE	The requestor lists the compound as one for which either new information is available or that detected amounts are close to levels of concern. IRIS lit. search project: significant new noncancer study data may be available.**
Methyl acetate	New Jersey DEP	No record	The requestor uses an RfD from the agency's HEAST but has no qualitative or quantitative assessment of the compound's carcinogenicity.
Methyl mercaptan	Pennsylvania DEP	No record	An assessment is needed to develop soil and groundwater cleanup standards under Pennsylvania DEP's Land Recycling and Cleanup Program (Act 2).
Methyl methacrylate	Methacrylate Producers Association, Inc.	On-line. Posted RfD, RfC, WOE	Record is dated 02/02/1998. The requestor states that a PBPK model is available for this compound. IRIS lit. search project: no significant new study data were identified.**
2-Methylnaphthalene***	Illinois EPA Minnesota DEH	No record	This compound is frequently detected at contaminated sites in Illinois and in groundwater in Minnesota.

Compound	Requestor	What's on IRIS Now?	Comments
4-Methylphenol	New Jersey DEP Minnesota DEH	On-line. Posted WOE, No toxicity values	An RfD was withdrawn 08/01/1991. New toxicity values are required for risk assessment. IRIS lit. search project: significant new noncancer study data may be available.**
Metsulfuron-methyl	Minnesota DEH	No record	This compound has been detected in groundwater in Minnesota.
Nicosulfuron	Minnesota DEH	No record	This compound has been detected in groundwater in Minnesota.
Nitrocellulose	USACE	No record	This compound is one of several explosives or explosive degradation products of interest to USACE.
Nitroglycerin	USACE	No record	This compound is one of several explosives or explosive degradation products of interest to USACE.
2-Nitrophenol	Minnesota DEH	No record	This compound has been detected in groundwater in Minnesota.
4-Nitrophenol	New Jersey DEP	On-line. No toxicity values	IRIS lit. search project: no significant new study data identified.**
PCB congeners	Virginia DEQ	On-line. Posted records for Aroclors 1016, 1248, 1254 and for PCBs as a group. Toxicity values include RfDs (for Aroclors 1016 and 1254) and a WOE, SF_os and an IUR for PCBs as a group	IRIS assessment (non-cancer endpoints) for PCBs as a group in progress, FY-2001. The itemized congeners are considered especially important for exposures via the food chain because of their potential to bioaccumulate.
Pentaerythritol tetranitrate	USACE	No record	This compound is one of several explosives or explosive degradation products of interest to USACE.

Compound	Requestor	What's on IRIS Now?	Comments
Phenanthrene	Illinois EPA Minnesota DEH	On-line. Posted WOE, No toxicity values	*Assessment of PAHs as a group in progress FY2002. This compound is frequently detected at contaminated sites and in groundwater in Minnesota.
Phorate	Minnesota DEH	No record	This compound has been detected in groundwater in Minnesota.
Phthalic anhydride	Minnesota DEH	On-line. Posted RfD	Guidance on the health effects of this sensitizer is required by the requestor. IRIS lit. search project: no significant new study data were identified.**
2-Picoline	Pennsylvania DEP	No record	An assessment is needed to develop soil and groundwater cleanup standards under Pennsylvania DEP's Land Recycling and Cleanup Program (Act 2).
Picric acid	USACE	No record	This compound is one of several explosives or explosive degradation products of interest to USACE.
n-Propylbenzene	Illinois EPA	No record	Toxicity values are required for this and other alkylbenzenes because of the large number of petroleum-related cleanup projects overseen by the state agencies.
Resorcinol	Pennsylvania DEP	No record	An assessment is needed to develop soil and groundwater cleanup standards under Pennsylvania DEP's Land Recycling and Cleanup Program (Act 2).
Sodium	Minnesota DEH	No record	

Compound	Requestor	What's on IRIS Now?	Comments
Sulfate	Minnesota DEH	No record	
Sulfur Mustard (HD)	USACE	No record	This compound is one of several militarily important compounds of interest to USACE.
Terbufos	Minnesota DEH	No record	This compound has been detected in groundwater in Minnesota.
Tetrabromodiphenyl ether	Virginia DEQ	On-line. Posted WOE, No toxicity values	The requestor points out that, while the toxicity of polybrominated diphenyl ethers is poorly understood, their production and consequent appearance in the environment is increasing. The compounds also have the capacity to bioaccumulate in fish tissue. IRIS lit. search project: no significant new study data were identified.**
1,1,2,2-Tetrachloroethane	Illinois EPA	On-line. Posted WOE, SF_o, IUR	NCEA Cincinnati provisional assessment contains a route-specific assessment not available on IRIS. This compound is frequently detected at contaminated sites in Illinois. IRIS lit. search project: no significant new study data were identified.**
Thiodiglycol	USACHPPM	No record	As a degradation product of the chemical warfare agent, sulfur mustard (HD), thiodiglycol has been detected in soil and water at certain Army installations. Although there are no toxicity values for this compound on IRIS, USACHPPM has evaluated toxicity and metabolic data for agency review.

Compound	Requestor	What's on IRIS Now?	Comments
Toxaphene	Hercules, Inc	On-line. Posted WOE, SF_o, IUR	Hercules Inc. considers the current IRIS record and its quantitative toxicity values to be out-of-date and superceded by more recent information. Furthermore, the company is withdrawing sponsorship of toxaphene under the IRIS collaborative program. IRIS lit. search project: significant new cancer study data may be available.**
1,1,1-Trichloroethane***	Minnesota DEH New Jersey DEP	On-line. Posted WOE, No toxicity values	IRIS lit. search project: significant new non-cancer study data may be available.** NCEA Cincinnati provisional assessment contains a route-specific assessment not available on IRIS; An RfD was withdrawn 02/01/1996.
1,2,3-Trichloropropane***	New Jersey Division of Science, Research and Technology	On-line. Posted RfD	NCEA Cincinnati provisional assessment contains a route-specific assessment not available on IRIS. The requestor has pointed to NTP data that demonstrate the carcinogenic potential of this compound. IRIS lit. search project: significant new noncancer study data may be available.**
1,2,4-Trimethylbenzene	Minnesota DEH Illinois EPA Minnesota Pollution Control Agency Alaska DEC	No record	Toxicity values are required for this and other alkylbenzenes because of the large number of petroleum-related cleanup projects overseen by the state agencies.

Compound	Requestor	What's on IRIS Now?	Comments
1,3,5-Trimethylbenzene	Minnesota DEH Illinois EPA Minnesota Pollution Control Agency Alaska DEC	No record	Toxicity values are required for this and other alkylbenzenes because of the large number of petroleum-related cleanup projects overseen by the state agencies.
Trinitrophenylmethylnitramine (Tetryl)	Minnesota DEH	No record	This explosive has been detected in groundwater in Minnesota.
Trinitrotoluene	USACE	On-line. Posted RfD, WOE, SF_o	IRIS lit. search project: no significant new study data were identified for 2,4,6-trinitrotoluene.** This compound is one of several explosives or explosive degradation products of interest to USACE.
Vanadium	New Jersey DEP	No record	IRIS carries a record for vanadium pentoxide
CHEMICAL CLASSES			
Acetanilide herbicide analytes	Minnesota DEH	No record	
Biological contaminants	Minnesota DEH	No records	
Clean Air Act Priority Pollutants (including carbon monoxide, lead, ozone, nitrogen oxides, particular matter and sulfur dioxide)	Minnesota Pollution Control Agency	No records	These substances are widespread in the environment and toxicity values are needed to assess the level of health concern.
Diesel range organics	Minnesota DEH	No record	
Gasoline range organics	Minnesota DEH	No record	
Petroleum hydrocarbons (aliphatic fractions)	Virginia DEQ	No record	The widespread detection of petroleum fractions and components at clean-up sites justifies the call for consensus on the quantitative toxicity of these fractions.

Compound	Requestor	What's on IRIS Now?	Comments
Petroleum hydrocarbons (aromatic fractions)	Virginia DEQ	No record	as above
Petroleum hydrocarbons (bulk)	Alaska DEC	No record	as above
Pharmaceuticals and their metabolites	Minnesota DEH	No records	
Polybrominated diphenyl ethers (PBDEs, also referred to as brominated flame retardants)***	Virginia DEQ Minnesota DEH Minnesota Pollution Control Agency	On-line records for the penta-, octa- and deca-analogues. Posted RfD and WOE for each analogue.	Virginia DEQ points out that while the toxicity of polybrominated diphenyl ethers is poorly understood, their production and consequent appearance in the environment is increasing. IRIS lit. search project (for penta-analogue): no significant new study data were identified.**
Radionuclides	Minnesota DEH	No records	
Triazine metabolites	Minnesota DEH	No record	

RfD = reference dose, RfC = reference concentration, WOE = weight of evidence of carcinogenicity, SF_o = oral slope factor, IUR = inhalation unit risk.
* Polycyclic aromatic hydrocarbon (PAH)
** Refers to U.S. EPA's literature screening project to assess the currency of the IRIS database. Currently, 460 of the chemicals on IRIS have been screened (see text).
Note: "What's on IRIS Now?" and IRIS literature screening results are current as of July 2003.
*** Substance has been added to EPA's IRIS agenda in FY 2002 or FY 2003.

Table 5. Reiterated Support from EPA Offices and Regions for IRIS Assessments in Progress

(These compounds were being updated or were undergoing initial assessment for IRIS at the time of the FR notice soliciting nominations (66 FR 37958). These substances were named by respondents as important to the interests of their organizations.)

Chemical Name	Requestor	What's on IRIS Now?	Comments
Acetaldehyde	OAQPS OTAQ	On-line. Posted RfC, WOE, IUR	Evaluation of this compound is important for OTAQ because of forthcoming efforts to address air toxics and gasoline/oxygenate blends.
Acrolein	OAQPS OTAQ Region 2	On-line. Posted RfD, RfC, WOE	Evaluation of this compound is important for OTAQ because of forthcoming efforts to address air toxics and gasoline/oxygenate blends.
Arsenic (inorganic)	OAQPS Region 2 Region 10	On-line. Posted RfD, WOE, SF_o, IUR	Region 2 cites a lack of agency-wide consensus on arsenic as justification for its nomination, particularly as its physiological mode of action is unclear. OW has completed an assessment. IRIS lit. search project: significant new noncancer and cancer study data may be available.**
Asbestos	OSWER Region 2 Region 8	On-line. Posted WOE, IUR	Additional and updated toxicological information is needed on this substance, which, along with other OSWER nominations, has emerged as important in public comments on the Hazardous Waste Identification Rule (HWIR) and the Inorganic Waste Listing. The substance is widespread at Superfund sites.
Benzene	OTAQ	On-line. Posted WOE, SF_o, IUR	Current record was posted 01/19/2000.

Chemical Name	Requestor	What's on IRIS Now?	Comments
Bisphenol A	OCHP	On-line. Posted RfD	The requestor identifies the compound as important because of concerns regarding children's health. IRIS lit. search project: significant new noncancer study data may be available.**
1,3-Butadiene	OAQPS OTAQ	On-line. Posted RfC, WOE, IUR	Evaluation of this compound is important for OTAQ because of forthcoming efforts to address air toxics and gasoline/oxygenate blends.
Cadmium	Region 8	On-line. Posted RfDs, WOE, IUR	Alternate RfDs are offered for cadmium in food vs. drinking water. Development of an RfC is a priority for Colorado Department of Public Health and the Environment to guide the review of air permits for active smelters.
Chloroethane (Ethyl chloride)	Region 2	On-line. Posted RfC	Frequently detected at Federal and State sites across the country.
Chloroform	Region 8	On-line. Posted RfD, WOE, SF_o, IUR	The absence of an RfC, a stand-alone IUR, and an oral slope factor applicable to low exposure rates are seen by Region 8 as important data gaps.
Copper (total)	Region 2	On-line. Posted WOE. No toxicity values	Frequently detected at Federal and State sites across the country.
1,3-Dichlorobenzene	Region 2	On-line. Posted WOE. No toxicity values	Frequently detected at Federal and State sites across the country.
1,4-Dichlorobenzene	Region 2	On-line. Posted RfC	Frequently detected at Federal and State sites across the country.
Diesel exhaust	OTAQ	On-line. Posted RfC, WOE	This assessment is vital to OTAQ for rule-making in regard to heavy-duty trucks.

Chemical Name	Requestor	What's on IRIS Now?	Comments
Di(2-ethylhexyl) phthalate	OSWER	On-line. Posted RfD, WOE, SF_o	This and other OSWER nominations are based on public comments on the Hazardous Waste Identification Rule (HWIR) and the Inorganic Waste Listing, and on their widespread occurrence at Superfund sites.
Dioxins and furans	Region 2	On-line record for hexachlorodibenzo-p-dioxin (mixture). Posted WOE, SF_o, IUR	The need for an agency consensus on the quantitative toxicity of these ubiquitous environmental pollutants is identified by the requestor.
Ethanol	OTAQ	No record	Evaluation of this compound is important for OTAQ because of forthcoming efforts to address air toxics and gasoline/oxygenate blends.
Ethylbenzene	OTAQ	On-line. Posted RfD, RfC, WOE	OTAQ lists this compound as a Title 1 Hazardous Air Pollutant and one of 21 mobile source air toxics.
Ethylene dichloride (1,2-dichloroethane)	Region 2 Region 5 Region 7	On-line. Posted WOE, SF_o, IUR	Region 7 has identified this compound as a priority in its states. The compound is an important air pollutant in the industrial cities of Region 5.
Ethylene oxide	OAQPS	No record	The requestor specifies the compound as a hazardous air pollutant.
Formaldehyde	OAQPS OTAQ	On-line. Posted RfD, WOE, IUR	The requestor specifies the compound as a hazardous air pollutant.
Hydrogen sulfide	OAQPS	On-line. Posted RfC, WOE	The requestor specifies the compound as a hazardous air pollutant.
Methyl isobutyl ketone	Region 2	On-line. Posted RfC, WOE	Frequently detected at Federal and State sites across the country. Posted RfD was withdrawn 08/01/1993.

Chemical Name	Requestor	What's on IRIS Now?	Comments
Methyl tertiary butyl ether	OTAQ	On-line. Posted RfC	Evaluation of this compound is important at OTAQ because of forthcoming efforts to address air toxics and gasoline/oxygenate blends.
PAHs	OSWER OAQPS Region 2	On-line records exist for 17 individual or substituted congeners. Posted WOE and SF_o for benzo(a)pyrene.	IRIS assessment (for PAHs as a group) in progress, -FY-2002. These contaminants are widely disseminated to the air during combustion.
PCBs	OCHP Region 2	On-line. Posted records for Aroclors 1016, 1248, 1254 and for PCBs as a group. Toxicity values include RfDs (for Aroclors 1016 & 1254) and a WOE, SF_os & an IUR for PCBs as a group.	Inhalation toxicity of PCBs has been identified by Region 2 as an important data gap. OCHP identifies PCBs as potential concern for the health of children.
Phosgene	OCHP OPEI	On-line. No toxicity values	The compound is important as a possible breakdown product of chloroform and carbon tetrachloride.
Styrene	OTAQ	On-line. Posted RfD, RfC	OTAQ lists this compound as a Title 1 Hazardous Air Pollutant and one of 21 mobile source air toxics.
Tetrachloroethylene	OAQPS Region 2 Region 8	On-line. Posted RfD	A quantitative carcinogenicity assessment is required for tetrachloroethylene by Region 8 since the compound is a Superfund program implementation priority.
Toluene	OTAQ	On-line. Posted RfD, RfC, WOE	OTAQ lists toluene as a Title 1 Hazardous Air Pollutant and one of 21 mobile source air toxics.
Trichloroethylene	OAQPS Region 2	On-line. No toxicity values	The requestor specifies the compound as a hazardous air pollutant.

Chemical Name	Requestor	What's on IRIS Now?	Comments
Xylenes	OTAQ OPEI	On-line. Posted RfD, RfC, WOE	A quantitative assessment of xylene's inhalation toxicity is important to the requestors because of the compound's ready release to the air at contaminated sites and from automobile exhausts.

RfD = reference dose, RfC = reference concentration, WOE = weight of evidence of carcinogenicity, SF_o = oral slope factor, IUR = inhalation unit risk
Note: "What's on IRIS Now?" and IRIS literature screening results are current as of July 2003.

Table 6. Reiterated Support from the Public* for IRIS Assessments in Progress

(*All Non-EPA Respondents to FR Notice 66 FR 37958, Including States, Other U.S. Governmental Agencies, Trade Organizations, Companies and Private Individuals)

(These compounds are currently being updated or undergoing initial assessment for inclusion on IRIS. Although outside the scope of the 66 FR 37958 solicitation, these substances were named by respondents as important to the interests of their organizations.)

Compound	Requestor	What's on IRIS Now?	Comments
Acrolein	Minnesota Pollution Control Agency New Jersey DEP	On-line. Posted RfD, RfC, WOE	The requestor lists the compound as one for which either new information is available or that detected amounts are close to levels of concern.
Alachlor ESA	Minnesota DEH	On-line. Posted RfD	
Ammonium perchlorate	Minnesota DEH	No record	
Arsenic	Minnesota Pollution Control Agency Minnesota DEH	On-line. Posted RfD, WOE, SF_o, IUR	The requestor lists the compound as one for which either new information is available or that detected amounts are close to levels of concern. IRIS lit. search project: significant new noncancer and cancer study data may be available.**
Benzene (non-cancer endpoints)	Minnesota Pollution Control Agency	On-line. Posted WOE, SF_o, IUR	
Bisphenol A	Illinois EPA Minnesota DEH	On-line. Posted RfD	Recent data are available on developmental effects in rodents. The compound has been detected in groundwater in Minnesota. IRIS lit. search project: significant new noncancer study data may be available.**
1,3-Butadiene	Minnesota Pollution Control Agency American Chemistry Council	On-line. Posted RfC, WOE, IUR	ACC urges the adoption of a proposed cancer potency value based on epidemiological data.

Compound	Requestor	What's on IRIS Now?	Comments
Chloroethane (Ethyl chloride)	New Jersey DEP Illinois EPA	On-line. Posted RfC	New Jersey DEP uses quantitative cancer and noncancer toxicity values from the agency's NCEA office.
Chloroform	Minnesota Pollution Control Agency	On-line. Posted RfD, WOE, SF_o, IUR	The requestor lists the compound as one for which either new information is available or that detected amounts are close to levels of concern.
Copper	New Jersey DEP	On-line. No toxicity values	The requestor uses an RfD from the agency's NCEA office.
Cyclotrinitraminemethylene (RDX)	USACE	Om-line. Posted RfD, WOE, SF_o	This compound is one of several explosives or explosive degradation products of interest to the USACE.
Diazanon	Minnesota DEH	No record	
1,3-Dichlorobenzene	New Jersey DEP	On-line. Posted WOE, No toxicity values	The requestor uses an RfD from the agency's NCEA office.
1,4-Dichlorobenzene	New Jersey DEP	On-line. Posted RfC	The requestor uses an RfD from the agency's NCEA office and a qualitative and quantitative cancer assessment from the agency's HEAST.
1,1-Dichloroethylene	Virginia DEQ Minnesota DEH	On-line. Posted RfD, WOE	Virginia DEQ requests a reassessment of the SF_o or the WOE classification for this chemical as these parameters apply to their establishment of a Water Quality Criterion for this chemical.
Diesel emissions	Minnesota Pollution Control Agency	On-line. Posted RfC, WOE	Cancer endpoints are of particular interest to the requestor.

Compound	Requestor	What's on IRIS Now?	Comments
Dioxins (2,3,7,8-TCDD)	New Jersey DEP USACE LEAF Minnesota Pollution Control Agency	On-line record for hexa chlorodibenzo-p-dioxin (mixture). Posted WOE, SF_o, IUR	The agency-wide dioxin reassessment is seen by LEAF as an example of the unsatisfactory pace at which IRIS is updated.
Ethylbenzene	Alaska DEC	On-line. Posted RfD, RfC, WOE	Alaska DEC's oversight of petrochemical cleanups establishes this chemical among its priorities.
Ethylene dichloride (1,2-dichloroethane)	New Jersey DEP	On-line. Posted WOE, SF_o, IUR	New Jersey DEP uses an RfD from the agency's NCEA office.
Formaldehyde	Minnesota Pollution Control Agency Minnesota DEH	On-line. Posted RfD, WOE, IUR	The requestor lists the compound as one for which either new information is available or that detected amounts are close to levels of concern.
Glyphosate	ACPA	On-line. Posted RfD, WOE	ACPA notes current inconsistences among EPA offices.
Hexachlorobutadiene	Minnesota DEH	On-line. Posted WOE, SF_o, IUR	Withdrawal of the RfD from IRIS has created a data gap for the requestor.
Hydrogen sulfide	Minnesota DEH	On-line. Posted RfC, WOE	Hydrogen sulfide emissions from feedlots are a concern in Minnesota.
Methyl isobutyl ketone	Minnesota DEH New Jersey DEP	On-line. Posted RfC, WOE	New Jersey DEP uses an RfD from the agency's HEAST.
Methyl tert-butyl ether	Minnesota DEH	On-line. Posted RfC	This compound has been detected in groundwater in Minnesota.
PAHs	Minnesota Pollution Control Agency Minnesota DEH	On-line records exist for 17 individual or substituted congeners. Posted WOE and SF_o for benzo(a)pyrene.	Minnesota PCA considers that evaluation should include an expanded list of those congeners considered to be carcinogenic.

Compound	Requestor	What's on IRIS Now?	Comments
Tetrachloroethylene	Minnesota Pollution Control Agency Minnesota DEH New Jersey DEP	On-line. Posted RfD	This compound is widespread in the environment and toxicity values are needed to assess the level of health concern.
Tetrahydrofuran	Minnesota DEH	No record	This compound has been detected in groundwater in Minnesota.
Toluene	Alaska DEC	On-line. Posted RfD, RfC, WOE.	Alaska DEC's oversight of petrochemical cleanups establishes this chemical among its priorities.
Trichlopyr	Minnesota DEH	No record	This compound has been detected in groundwater in Minnesota.
Trichloroethylene	Minnesota Pollution Control Agency Minnesota DEH New Jersey DEP	On-line. No toxicity values	This compound is widespread in the environment and toxicity values are needed to assess the level of health concern.
Xylene	Alaska DEC	On-line. Posted RfD, RfC, WOE	Alaska DEC's oversight of petrochemical cleanups establishes this chemical among its priorities.

RfD = reference dose, RfC = reference concentration, WOE = weight of evidence of carcinogenicity, SF_o = oral slope factor, IUR = inhalation unit risk
Note: "What's on IRIS Now?" and IRIS literature screening results are current as of July 2003.

Table 7. Responses to Question 1 of the Agency's IRIS Needs Assessment

How do you/your organization use IRIS? What actions or decisions are based on information in IRIS?

Respondent Affiliation	Input Response
U.S. EPA Region and Program Offices	
U.S. EPA Region 5	IRIS is a critical tool for quantitative risk analysis and for setting scientifically supportable risk-based cleanup goals.
U.S. EPA Region 2	The toxicological information on IRIS supports site-specific risk assessments, the development of clean-up goals, and the criteria and standards set by State agencies.
States, Industry, Non-U.S. EPA Governmental Agencies and Members of the Public	
Illinois EPA	Toxicity values on IRIS are used in risk assessments and to calculated generic remediation objectives for soil and groundwater.
Virginia DEQ	Toxicity assessments on IRIS are used to calculate screening values for media-specific contaminants and to calculate the risks to potentially exposed receptors.
Minnesota DEH	IRIS is a primary source of health-based data for developing quantitative criteria for the management of air and water pollutants.
New Jersey DEP	IRIS is a major source of toxicity information for the State's development of media-specific clean-up standards.
Alaska DEC	IRIS is the primary source of toxicity information for developing clean-up targets for contaminated sites.
American Chemistry Council	IRIS is one of the most frequently cited sources of health effects values for regulatory purposes.
ACPA	As the primary repository of toxicological information for State, Federal and (increasingly) International agencies, IRIS is crucial to the regulated community.
USACE	IRIS toxicity values are used for risk assessments in several USACE programs and to determine project eligibility for and priority within these programs.
Pennsylvania DEP	The IRIS database is used for risk assessments and to develop soil and groundwater clean-up standards.

Respondent Affiliation	Input Response
New Jersey Division of Science, Research and Technology	IRIS toxicity values are used to develop health-based standards, clean-up criteria and permitted levels. An IRIS record's technical details/discussions of studies are also critical as a guide for the respondent's own evaluations of chemicals (with no IRIS records).
Minnesota Pollution Control Agency	Toxicity values on IRIS are used in permitting and remediation and to prioritize environmental threats.
Toxicology Excellence for Risk Assesssment	IRIS is a key source to toxicity information that TERA uses in its International Toxicity Estimates of Risk (ITER) database. IRIS also is a source of useful information for TERA's community health projects.
Industry Task Force II on 2,4-D Research Data	The respondent does not use IRIS for toxicity information on 2,4-D because they perceive it to be out-of-date and incomplete.

Table 8. Responses to Question 4 of the Agency's IRIS Needs Assessment

What additional types of substance-specific Agency consensus information would you like to have on IRIS? For example, EPA is considering adding consensus health assessments for exposures of less than chronic duration, such as acute and possibly subchronic exposures. Would these types of information be of value to you? If so, how important would this information be to you in comparison to having updated information on chronic health effects?

Respondent Affiliation	Input Response
U.S. EPA Region and Program Offices	
Region 5	Toxicological evaluations on IRIS should emphasize the widest range of toxicological information. For example, developmental, behavioral and immunological deficits might represent especially sensitive endpoints relevant to protecting the health of children. Notwithstanding time and cost constraints, new and updated IRIS assessments should include children's risk considerations. While information on the acute toxicity of chemicals would be a useful addition to IRIS, this need is secondary to the importance of updating chronic health effects information. Furthermore, to include acute toxicity information may not be a cost-effective use of resources where other EPA and non-EPA entities such as ACGIH are currently pursuing similar initiatives.
Region 2	Consensus acute and subchronic evaluations on IRIS would be a useful additional resource, with particular relevance to "hot-spot" removal and to ensuring that chronic remedial levels are also protective of acute exposures across a site.
OTAQ	Subchronic health assessments would be of great value to OTAQ since mobile source emissions frequently result in high levels of exposure for a comparative short duration.
OAQPS	The development of acute reference values within the framework of the acute reference exposure (ARE) methodology is strongly endorsed.
OCHP	Valuable though the addition of acute and subchronic reference values to IRIS may be, the need to update existing files with new chronic information and developing chronic files for additional substances should take precedence. OCHP also suggests the incorporation of a brief section in each IRIS record addressing children's health issues.

Respondent Affiliation	Input Response
OPEI	The highest priority for IRIS should be to add information on chronic toxicity of new chemicals or to fill data gaps. The health implications of chemicals to sensitive sub-populations and children should be stressed. These issues would have higher priority than acute and subchronic information. Formal evaluation of data gaps would markedly improve IRIS records.
States, Industry, Non-U.S. EPA Governmental Agencies and Members of the Public	
Illinois EPA	Illinois EPA endorses the development of acute and subchronic RfDs and RfCs for incorporation into IRIS, even though this might delay the development or updating of chronic values.
Virginia DEQ	Virginia DEQ would welcome the inclusion of subchronic RfDs on IRIS, but considers that, in the event of budgetary constraints, updated information on chronic health effects should take precedence.
Minnesota DEH	The inclusion of acute and subchronic toxicity values on IRIS is endorsed. Other items of value would include more emphasis on a carcinogen's mechanism of action and any available information on a chemical's developmental effects. Notes on a compound's regulatory history and the identity of an agency contact person should be (re)introduced.
New Jersey DEP	The addition of consensus acute/subchronic toxicity information would be strongly endorsed, although updating chronic health effects should remain IRIS' first priority.
Alaska DEC	Information on the subchronic toxicity of target contaminants would be a valuable addition to IRIS.
American Chemistry Council	In a wide-ranging analysis and critique of the IRIS process, the respondent disagrees with the suggested inclusion of acute toxicity information on IRIS. Channeling resources from the primary requirement of updating existing records and adding new records to the database might diminish the database's utility as the primary source of quantitative toxicity information for risk analysis.
USACE	The need to include acute and subchronic toxicity data on IRIS is recognized, although updating chronic toxicity information and adding more records should take precedence.
Pennsylvania DEP	The inclusion of subchronic toxicity information in IRIS would be highly applicable to risk assessments where populations are exposed on a short-term basis.

Respondent Affiliation	Input Response
New Jersey Division of Science, Research and Technology	The inclusion of acute and subchronic toxicity information on IRIS is seen as a valuable addition, particularly as it would relate to issues such as whether sources of drinking water could be used on an interim basis pending corrective action.
Minnesota Pollution Control Agency	Health assessment for shorter exposure patterns would be an important addition to IRIS. The respondent would also like to see more detailed dose-response data for non-cancer effects included in the record.
Toxicology Excellence for Risk Assessment	While recognizing the value of including less-than-chronic toxicity information on IRIS, TERA considers the first priority to be updating chronic toxicity information of existing records.
Industry Task Force II on 2,4-D Research Data	The respondent has high interest in data on short term exposure and considers the addition of subchronic, metabolic and mutagenicity studies to the record to be of great value.

Table 9. Responses to Question 5 of the Agency's IRIS Needs Assessment

EPA is currently testing collaborative efforts with external parties on the development of assessments for IRIS (66 FR 11165). The purpose is to involve the scientific knowledge and capability of organizations outside of EPA to improve the quality of IRIS supporting documents. External parties may include other government agencies, industries, universities, professional organizations, and other non-governmental organizations. EPA will evaluate the efficiency of the process and quality of documents produced to determine if the collaborative program should be expanded. Do you favor EPA's collaboration with external parties as a means of developing assessments for IRIS? If so, how could this collaboration be conducted?

Respondent Affiliation	Input Response
U.S. EPA Region and Program Offices	
Region 5	Region 5 does not endorse the involvement of external parties in the direct development of IRIS reviews beyond the current peer review process. Avoidance of conflicts of interest would be important in any expanded mechanism, with the overall control of the agency remaining paramount.
Region 2	Detailed guidelines would have to be in place to ensure that an expanded participation of external organizations and groups in IRIS record development maintained the current standard of scientific rigor. External peer-review, independent analysis and public participation would be important safeguards.
OAQPS	OAQPS considers external involvement in IRIS assessments likely to contribute to scientifically sound assessments.
OCHP	While provision of information from external sources may improve the overall quality of IRIS support documents, agency control of assessments and the peer-review process is essential. The potential for perceived or actual conflicts of interest is manifest where regulated entities prepare assessments in whose outcome they have a direct economic interest. A critical evaluation of the current pilot scheme should confirm or deny the viability of this expanded role for external parties in IRIS development.
OPEI	External participation in IRIS developments may be beneficial but agency control of assessments and the peer-review process would be necessary to address conflict of interest concerns.

Respondent Affiliation	Input Response
States, Industry, Non-U.S. EPA Governmental Agencies and Members of the Public	
Illinois EPA	Toxicological assessments from parties outside the U.S. EPA might represent a valuable starting point to the evaluation process. While mentioning conflict of interest concerns, the respondent visualizes an agency-sponsored "bulletin board" to which parties could contribute information on chemicals of interest.
Minnesota DEH	In any collaborative efforts to update or supplant IRIS toxicity assessments, the importance of peer-review and overall agency control is emphasized. However, with safeguards, the process could be beneficial.
New Jersey DEP	Agency collaboration with external parties is endorsed as a means of expediting the placement of new chemicals within the IRIS framework and of updating old records. The establishment of detailed guidelines for participants and a rigorous peer-review mechanism would be crucial to the success of such an initiative.
American Chemistry Council	Producers of chemicals and other interested parties should be able to develop and submit IRIS toxicological reviews for the agency's evaluation, thereby allowing the agency to concentrate its resources in a review capacity. Within this context, the respondent has drawn up a detailed framework by which IRIS assessments could be improved, emphasizing up-to-date methodologies, transparent peer review, realistic time-lines, adequate funding, and prioritization.
LEAF	Collaboration between industry and the agency in toxicity assessments is unacceptable to the respondent because of conflict of interest concerns.
USACE	Industry-agency collaboration for developing IRIS assessments is favored within a scientific review board structure in which panel members might represent the external parties.
Pennsylvania DEP	While the participation of universities, other governmental agencies and professional organizations may be beneficial, the involvement of interested parties in data selection could introduce partiality. Agency oversight of external development of assessments would be crucial.
New Jersey Division of Science, Research and Technology	Assessments conducted by states, other federal agencies, industry or other organizations could be reviewed for incorporation into IRIS, with substantial savings in time and cost.

Respondent Affiliation	Input Response
Minnesota Pollution Control Agency	While collaboration with external parties has potential for developing IRIS assessments, the role of external parties should be limited to data development and review. Specifically, the involvement of external parties in document production or the development of toxicity values is not endorsed. Potential conflicts of interest should be identified in all endeavors involving external parties.
Toxicology Excellence for Risk Assessment	Collaboration between industry and the agency is strongly endorsed as a means of accessing technical expertise and saving money. Conducting peer reviews through independent entities such as TERA would ensure scientific rigor and adherence to agency policies.
CPC, Inc.	Toxicological reviews which have undergone peer review by non-profit entities should be incorporated into IRIS. The respondent's primary concern with the toxicity of barium is cited as an example of this process.
Industry Task Force II on 2,4-D Research Data	Industry-agency collaboration is strongly favored.

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